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Philips Medical Systems

parts list

Philips Medical Systems Nederland B.V. | Technical Service | Best

SERVICE PARTSLIST UNIT

PEI: 9807 603 60001

DESCRIPTION: CASSETTEHOLDER BV29

SERIAL NR:

List of pages and drawings

*printing instructions 4522 983 32271

SCHEME/ PAGE	INDEX	CODENUMBER	DESCRIPTION	DATA
PZ- 1	a	2622 115 00255	tension spring	2x
PZ- 1	b	4522 128 10051	end stop	2x
PZ- 1	c	4522 103 87461	cap	
PZ- 1	d	2622 115 10002	Belleville washer	28x
PZ- 1	e	4522 128 10152	fastener	
PZ- 1	f	4522 128 10062	cap nut	
PZ- 1	g	4522 128 10022	housing	
PZ- 1	h	4522 128 10032	shaft	
PZ- 1	j	4522 128 10071	knob	
PZ- 1	k	2622 115 02372	compression spring	
PZ- 1	l	4522 128 10161	clamping ring assy	

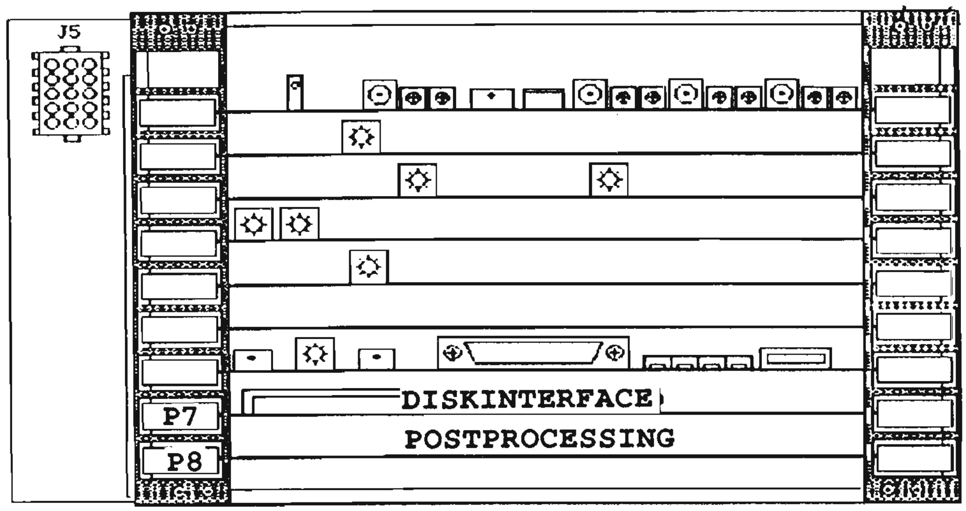
SERVICE PEI MANUALS
BV29 SYSTEM

MODULE CODE NUMBER : 4522 983 52213

LIST OF PAGES AND DRAWINGS

SERVICE MANUAL - UNIT

Image Storage & Handling Extension



This manual contains information on the IMAGE STORAGE & HANDLING EXTENSION option.

IPSC: Best

IMAGE STORAGE AND HANDLING EXTENSION

SERIAL NUMBER:

LIST OF PAGES AND DRAWINGS

Printing instructions: 4522 983 52601

Section : IMAGE STORAGE & HANDLING EXT.

Contents

1. INTRODUCTION

The IMAGE STORAGE AND HANDLING EXTENSION offers the following functions:

- Storage : 190 images on hard disk.
- Mosaic : displaying of 16 images from hard disk simultanuously.
- Zoom : increasing the area of intrest.
- Measure : indicating the relative difference in vessel diameter of two selected cross sections.

2. ITEMS SUPPLIED

The following items are part of the delivery:

- NEC 3.5-in. Disk Drive.
- Digital Scopofix MMP Diskinterface board P7.
- Digital Scopofix MMP Postprocessing board P8.
- Cabling for connection between:
  WFX2 - WHDP7J1 (flatcable)
  WFX1 - WHDP7J2 (four wire cable)
- Mounting material for Hard Disk:
  (a mounting plate, 4 screws M4 with 4 spring washers, 4 screws M3 with 4 rivets and 4 spring washers and 4 ty-raps.)

3. COMPATIBILITY

The IMAGE STORAGE & HANDLING EXTENSION is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

4.1. MEMORY BOX UNIT TROLLEY

For pulling out the complete Memory Box Unit (MBU) do:

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the MBU half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging of the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out the Memory Box Unit completely (Unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing the 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the blocking screw at the left side, so that the MBU can be pulled out a little bit more to have better access to loosen the EMC-plate covering the location for the Hard Disk.

NOTE

REMOVE THE SCREWS CAREFULLY.

- Remove the EMC-plate covering the location of the Hard Disk (12 screws).

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit completely (Unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing the 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the blocking screw at the left side, so that the MBU can be pulled out a little bit more to have better access to loosen the EMC-plate covering the location for the Hard Disk.

NOTE

REMOVE THE SCREWS CAREFULLY.

- Remove the EMC-plate covering the location of the Hard Disk (12 screws).

4.2. DISK INTERFACE BOARD P7 AND POSTPROCESSING BOARD P8

NOTE

USE ELECTROSTATIC DISCHARGE BRACELET WHEN PUTTING IN THE BOARDS

Procedure:

- Put DISKINTERFACE BOARD on postion P7.
- Put POSTPROCESSING BOARD on position P8.

4.3. HARD DISK (WF)

Procedure:

- Mount the HARDDISK on the mounting plate with 4 screws M3, 4 rivets and 4 spring washers.

NOTE

BEFORE MOUNTING THE HARDDISK MAKE SURE THAT THE INSERTS IN THE 4 VIBRATION DAMPERS ARE CLEAR (NO RUBBER).

THE HARDDISK FLATCABLE CONNECTOR MUST BE LOCATED AT THE LEFT SIDE

- Mount the HARDDISK with mounting plate on the 4 vibration dampers.
  Use the delivered mounting material (4 screws M4 and 4 spring washers).
- Connect cables:
  . WFX1 - WHDP7-J2 (four wire cable)
  . WFX2 - WHDP7-J1 (flat cable)

- Remount the PCB holding plates, both EMC-plates, blocking screw and covers.

5. SETTING TO WORK

- Leave the MMP-unit open.
- Enter the SERVICE MENU.
- Select the MBC UTIL & FREQUENCY menu (line 40).

- Set CHANGE MODE in order to change current settings.
- Put jumper WT2 : S1-5 in position on.
- Select line 43 (Format disk).
- Press <ACC> .
- Give "Y".
- Wait until refreshed menu appears (after 5 sec).
  Text in lower left corner: "FORMATTING DISK"
- Service menu appears after the DISK is formatted.

  RETURN TO MAIN MENU.

  EXIT SERVICE MENU.

  Leave CHANGE MODE.
- Put jumper WT2 : S1-5 in position "OFF".

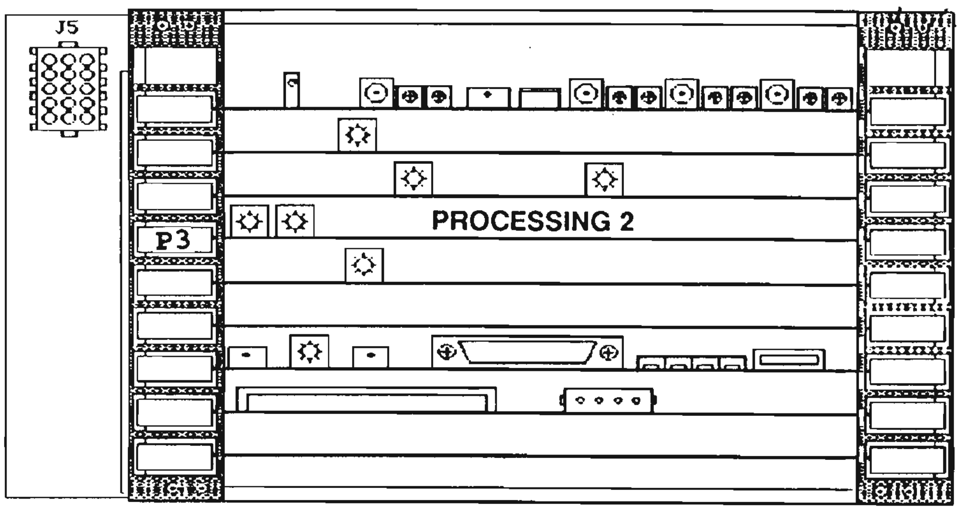
- Push back MMP-unit.
- Tighten the four screws wich holds the MMP-unit.

6. CHECKING THE FUNCTIONS

Check the functions of the IMAGE STORAGE & HANDLING EXTENSION:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

Angiography Extension



This manual contains information on the ANGIOGRAPHY EXTENSION option.

IPSC: Best

ANGIOGRAPHY EXTENSION

SERIAL NUMBER: 1131227Ø

LIST OF PAGES AND DRAWINGS

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1-2	(92.1)E*
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Printing instructions: 4522 983 52611

Section : ANGIOGRAPHY EXT.

Contents

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The following items are part of the delivery:

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- Digital Scopofix MMP Diskinterface board P7.
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  WFX2 - WHDP7J1 (flatcable)
  WFX1 - WHDP7J2 (four wire cable)
- Mounting material for Hard Disk:
  (a mounting plate, 4 screws M4 with 4 spring washers, 4 screws M3 with 4 rivets and 4 spring washers and 4 ty-raps.)

3. COMPATIBILITY

The IMAGE STORAGE & HANDLING EXTENSION is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit (MBU) half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the -dummy- PROCESSING 2 BOARD on position P3.
- Place the PROCESSING 2 BOARD on position P3.
- Exchange the footswitch with the delivered footswitch.

- Reassemble in reverse order.

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the -dummy- PROCESSING 2 BOARD on position P3.
- Place the PROCESSING 2 BOARD on position P3.
- Exchange the footswitch with the delivered footswitch.

- Reassemble in reverse order.

5. SETTING TO WORK

NOTE

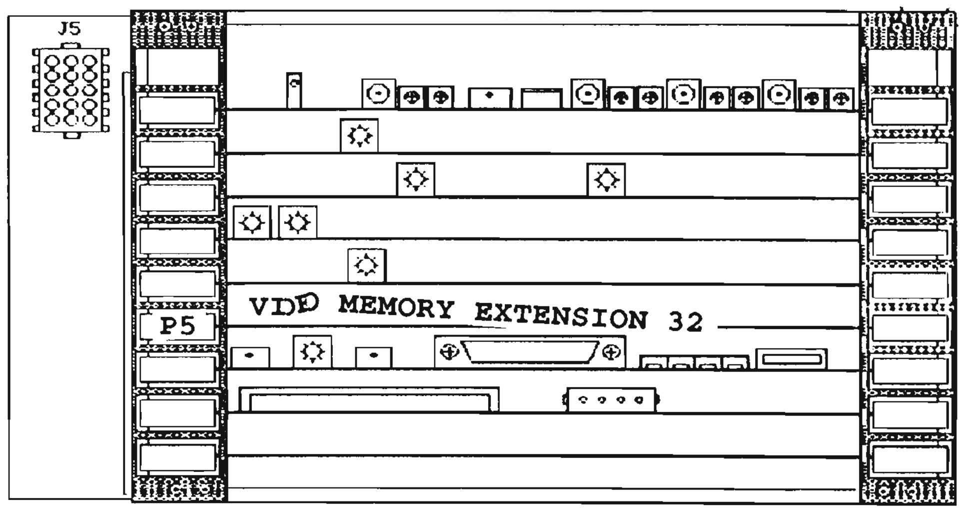
NO SETTING TO WORK INSTRUCTIONS HAVE TO BE CARRIED OUT AFTER INSTALLATION OF THIS OPTION.

6. CHECKING THE FUNCTIONS

Check the functions of the ANGIOGRAPHY EXTENSION:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

Video Memory Extension for ~~32~~ 128 Images



This manual contains information on the VIDEO MEMORY EXTENSION FOR 32 IMAGES option.

IPSC: Best

VIDEO MEMORY EXTENSION FOR ~~32~~ 128 IMAGES

SERIAL NUMBER: 1131220 6

LIST OF PAGES AND DRAWINGS

Printing instructions: 4522 983 52621

VIDEO MEMORY EXTENSION FOR 32 IMAGES

Contents

1. INTRODUCTION

The VIDEO MEMORY EXTENSION FOR 32 IMAGES offers the following functions:
- 32 image video memory for cine display.
- Replay last FLUORO scene.
- Selectable acquisition frame speed.
- Cine loop editing.

2. ITEMS SUPPLIED

The following item is part of the delivery:

- Digital Scopofix MMP CINE MEMORY BOARD P5.

3. COMPATIBILITY

The VIDEO MEMORY EXTENSION FOR 32 IMAGES is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit (MBU) half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Place the CINE MEMORY BOARD on position P5.

- Reassemble in reverse order.

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Place the CINE MEMORY BOARD on position P5.

- Reassemble in reverse order.

5. SETTING TO WORK

NOTE

NO SETTING TO WORK INSTRUCTIONS HAVE TO BE CARRIED OUT AFTER INSTALLATION OF THIS OPTION.

6. CHECKING THE FUNCTIONS

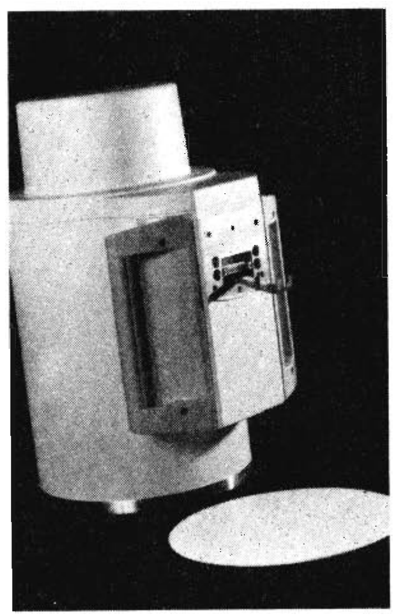
Check the functions of the VIDEO MEMORY EXTENSION FOR 32 IMAGES:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

23cm shield assy for surgery

9896 010 02311

For serial numbers, see list of pages and drawings



This manual contains descriptive information on the equipment identified by the number stated above. For information on specific application, see the system manual.

IPSC: Best

SERVICE MANUAL-UNIT
23cm shield assy for surgery
TYPE NO. : 9896 010 02311

SERIAL NO. :

Manual codenumber : 4522 983 54411

List of Pages and Drawings

Contents

1. INTRODUCTION AND TECHNICAL DATA

1.1. PURPOSE

This 23 cm II tube assembly is applied in the BV29 system. The shield has been designed for housing; a 23cm II-tube, a basic lens, an XTV-8SRI camera, an adaptation board and an II-generator in the II side box.

1.2. ITEMS SUPPLIED

The numbers in the list refer to the items in figure (a) on page 25.

1. shield with side box
2. camera cover
3. couple-plate
4. hand-grip (2x)
5. pressure ring
6. finishing ring with implosion plate, μ-metal ring + lead ring
7. vibration dampers
8. BV29 II/TV adaptation board BA1

In plastic bag:
- 4 screws M4 x 10 for mounting a grid on the finishing ring.
- 4 identification plates, see info at para. 1.3.

cabling set (6 cables) as shown on drawing Z2-1.

1.3. EQUIPMENT IDENTIFICATION

The identification plates are located on the central labelling station of the system and on the inner side of the camera cover as indicated on page 25. Included are the following plates:

- Name and Address plate.
- Manufacturer plate.
- HHS date of manufacture.
- Type number plate with serial number of the 23 cm II tube assy
- HHS certification label.
- UL/CSA classification mark.

NOTE

In case of replacement of certifiable items always replace duplicate label on the inside of the camera cap and on the central labelling station "i" of the BV29.

1.4. TECHNICAL DATA

1.4.1. Dimensions and weights

Overall dimensions: see drawing Z9-1, total weight: ≈ 200 N = ≈ 20 kg.

1.4.2. Protections

X-Rays	The shield, camera cover and other relevant parts are provide with a lead lining to protect the environment against radiation of x-ray beams which are projected perpendicular to the entrance screen
Magnetic shielding	The shield is provided with μ-metal to minimize the effect of weak alternating or static magnetic fields inside the container. All parts of the shield are made of non-magnetic material.
Mechanical	In case the II tube implodes, an implosion plate protects the environment against fragments of the tube.

1.4.3. Compatibility

The 23cm shield assembly for surgery is compatible with the following items:
- 23cm II-generator non blanking
- 23cm II-tube
- XTV-8SRI camera
- mobile surgery stand BV29

1.4.4. Adaptations

The 23 cm II tube assembly can be adapted to the following equipment, which are no part of this assembly:

Mobile stand BV29	The couple-plate is the interface between the BV 29 Stand and the shield assembly. The cable of the stand leading to the shield has to be fitted to the connector X1 of the II/TV adaptaion board BA1 on the couple-plate and to the earth point on the cable relief bracket.
XTV-8SRI camera	the basic lens is fitted to the II-tube with three adjusting bolts in the centring ring. The XTV camera can be mounted directly to the basic lens with a quick locking device.
II compact generator	Can be mounted in the II side box.
23 cm multi mode II-tube	The II-tube must be fitted in the container in one position (markers are on the shield and on the tube).
Grid	The grid is screwed to the front of the container.
Service phantom plate	After removing of the grid a phantom plate can be fitted in two positions (90° rotated) to the front of the container.

1.4.5. Applicable standards

The following standards are applicable to the 23 cm II tube assembly.

PMS products are developed and manufactured with observance of a number of directives, regulations and standards. (e.g. International product safety standards as IEC, ISO, CISPR and national performance and product safety as 21CFR Subch. H and J, U.L., CSA, DIN and VDE.)
Information regarding the compliance status with standards and product approvals is obtainable at:

Philips Medical Systems
Corporate Quality Department
Regulation and approbation Group
Building QM 118
PO Box 10,000
5680 DA BEST
The Netherlands
Fax. No. : 31-40-762205/762420
Tel. No. : 31-40-762408
Telex No. : 35000 PHTC NL
routing indicator XLQBUXA

2. Installation

Normally the shield-assy is delivered in a factory assembled and -adjusted II/TV-subsystem and no mechanical adjustments are required in the field.

2.1. Tools

This assembly can be installed with a standard toolset.

3. Replacements

3.1. Remove the shield assy from the stand

(1) move the shield assy towards the stand (+ 90° skew), the X-ray tank is pointing in the air now
(2) support the X-ray tank (with a table or a chair) in such a way that you can not move the C-bow

Warning

When the shield assy is removed there is a large force (from the X-ray tank) pointing in the air. Support the X-ray tank for your own safety.

(3) remove the top cover from the shield
(4) disconnect all the cables from the II/TV adaptation PCB
(5) remove the two hand grips from the shield
(6) disconnect WK4: X1, X2 and X3 from the camera, loosen the camera locking devise and remove the camera from the basic lens
(7) remove the 6 screws from the couple-plate see Fig.1 page 26

3.2. Exchanging the II/TV adaptation PCB (BA1)

(1) execute paragraph 3.1.
(2) remove the plastic cover infront of the PCB (2 screws)
(3) remove the PCB from the couple-plate (4 screws) see Fig.2 page 26
(4) disconnect BA1:X1 from the defective PCB and connect the new PCB
(5) mount the new PCB to the couple-plate and the plastic cover to the PCB
(6) execute para. 3.5.

3.3. Exchanging the HT II-generator

(1) execute paragraph 3.1.
(2) disconnect BGC1: X6, X7, X8 and X9 from the HT-unit
(3) remove the HT-unit (3 screws) from the shield see Fig.3 page 26
(4) disconnect BGC1: X2 and X3, connect the cables X2 and X3 to the new HT-unit
(5) mount the HT-unit to the shield (3 screws)
(6) connect BGC1: X6, X7, X8 and X9
(7) execute para. 3.5.

3.4. Exchanging the II-tube

(1) execute paragraph 3.1.
(2) disconnect BGC1: X6, X7, X8 and X9 from the HT-unit and the earth lead from BA1
(3) remove the basic-lens from the II-tube (3 screws)
(4) remove the X-ray grid (4 screws)
(5) remove the finishing ring form the shield (4 screws)
(6) remove the ring with implosion plate
(7) loosen the: 3 centre-plates (2 screws each) on the pressure ring, Fig.4 page 26
3 bolts (to unlock the adjusting screws)
3 adjusting screws, see also the top-left Fig. 10 on page 25
(8) remove the pressure ring (7 screws see also the top-left Fig. item 12 page 25)
(9) see Fig.5 page 26 remove the 3 bolts from the shield
(10) remove the shield from the II-tube guide the cables through the cable outlet of the shield
(11) remove the 3 vibration dampers from the II-tube and mount them to the new II-tube
(12) guide the cables of the new II-tube through the outlet of the shield and move the tube into the shield. Fit the tube so that the marker on the tube is in line with the marker on the shield, see the top-right figure at page 25
(13) mount the tube to the shield with 3 bolts, see Fig.4
(14) possition the pressure ring in the shield so that the opening of the ring is in the middle of the side box vasten the pressure ring (7 screws see top-left Fig. item 12 page 25) begin at one side of the opening (of the pressure ring) and move onwards untill you reach the other side of the opening of the ring.
(15) turn the adjustment screws (3) untill you feel a resistance and lock them with the bolt
(16) mount the ring with implosion plate; the finishing ring and finaly the grid to the shield
(17) mount the basic lens carefully to the II-tube (3 screws)
(18) connect BGC1: X6, X7, X8 and X9 to the HT-unit and the earth lead to BA1, see Fig.3 page 26
(19) execute para. 3.5.

3.5. Mount the shield assy to the stand

(1) mount the shield assy back to the couple-plate (on the stand), with 6 screws see Fig.1 page 26
(2) mount the camera to the basic lens and connect WK4: X1, X2 and X3 to the camera
(3) mount the two hand grips to the couple-plate
(4) connect all the cables to the II/TV adaptation PCB
(5) mount the top cover to the shield

4. ADJUSTMENTS

Normally the shield-assy is delivered in a factory assembled and -adjusted II/TV-subsystem and no electrical adjustments are required in the field.

4.1. ADJUSTMENT FACILITIES

On the BV29 II/TV adaptation board the following adjustments have to be executed:
- BA1:R1, focusing for 13 cm format
- BA1:R2, focusing for 17 cm format
- BA1:R3, focusing for 23 cm format

The measuring points on this board are:
- BA1:MP1, FSM focusing service mode (cathode voltage for each format)
- BA1:MP2, FSMR focusing service mode reference (0Vref)
- BA1:MP3, Video out signal

4.2. ELECTRICAL FOCUSING ADJUSTMENT

General: Stay out of the primary X-ray during focusing of the II-Generator.

Adjustment procedure:
- remove all the filters between the X-Ray Tube and the II Tube
- mount a 23 cm holder with funk phantoms in front of the II
- select the 23 cm II-format
- connect a multimeter between BA1:MP1 and BA1:MP2 on the Adaptation Board (BA1) in the side-box of the shield.
- switch on fluoroscopy in automatic mode.
- adjust the focusing voltage (VC) of the II-tube to a optimum with potentiometer BA1:R3
- switch off fluoroscopy
- select the 17 cm II-format
- switch on fluoroscopy in automatic mode
- adjust the focusing voltage (VC) of the II-tube to a optimum with BA1:R2
- switch off fluoroscopy
- select the 13 cm II-format
- switch on fluoroscopy in automatic mode
- adjust the focusing voltage (VC) of the II-tube to a optimum with BA1:R1
- switch off fluoroscopy
- note down the focusing-value, (BA1:MP1 and MP2) of each format, on a measuring sheet.

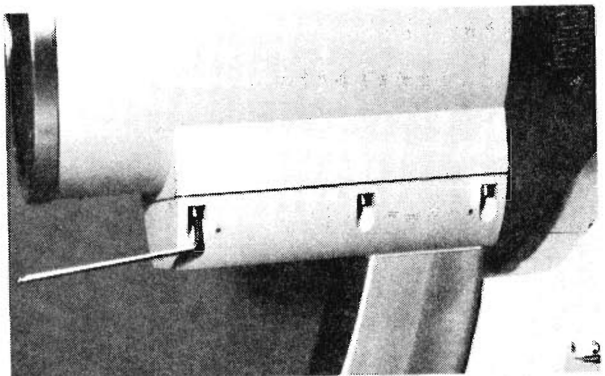


Fig.1 , shield connected to the couple-plate.

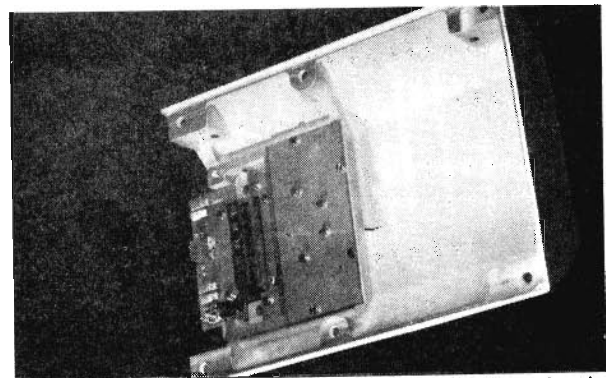


Fig.2 , couple-plate with BA1 board, the plastic cover is already removed.

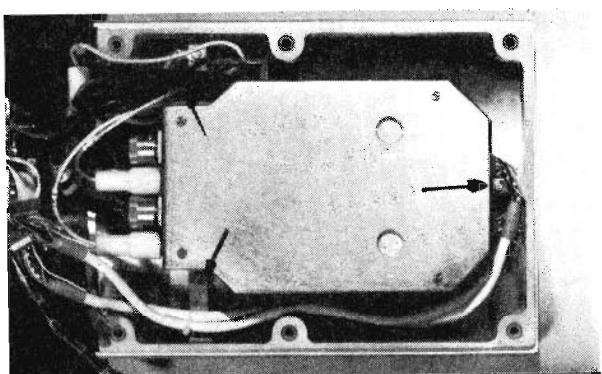


Fig.3 , II-generator mounted in the side box with 3 screws.

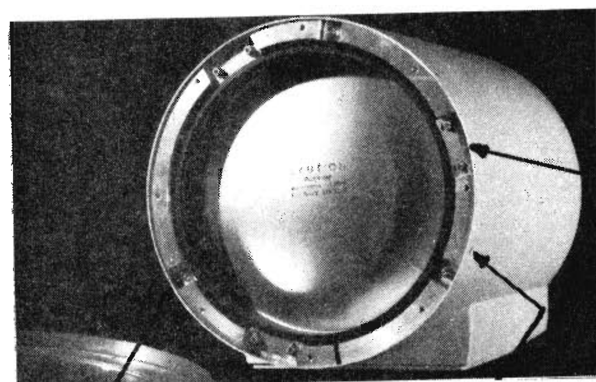


Fig.4 , pressure ring vastened at the side of the shield. see also the centre-plates and the adjustment screws.

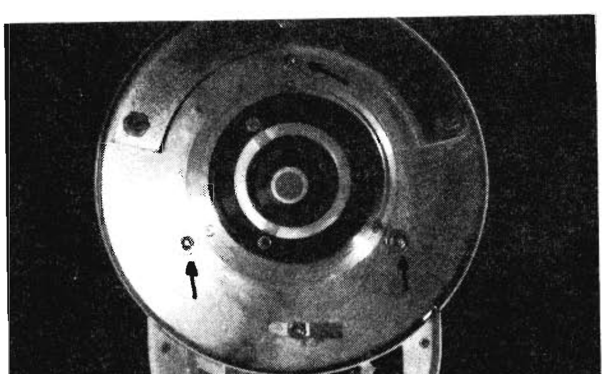


Fig.5 , connection of the II-tube to the shield

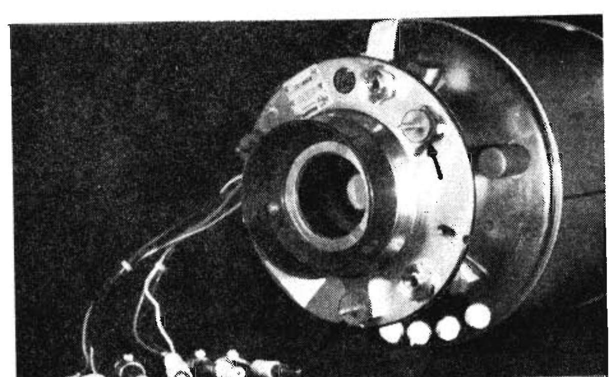
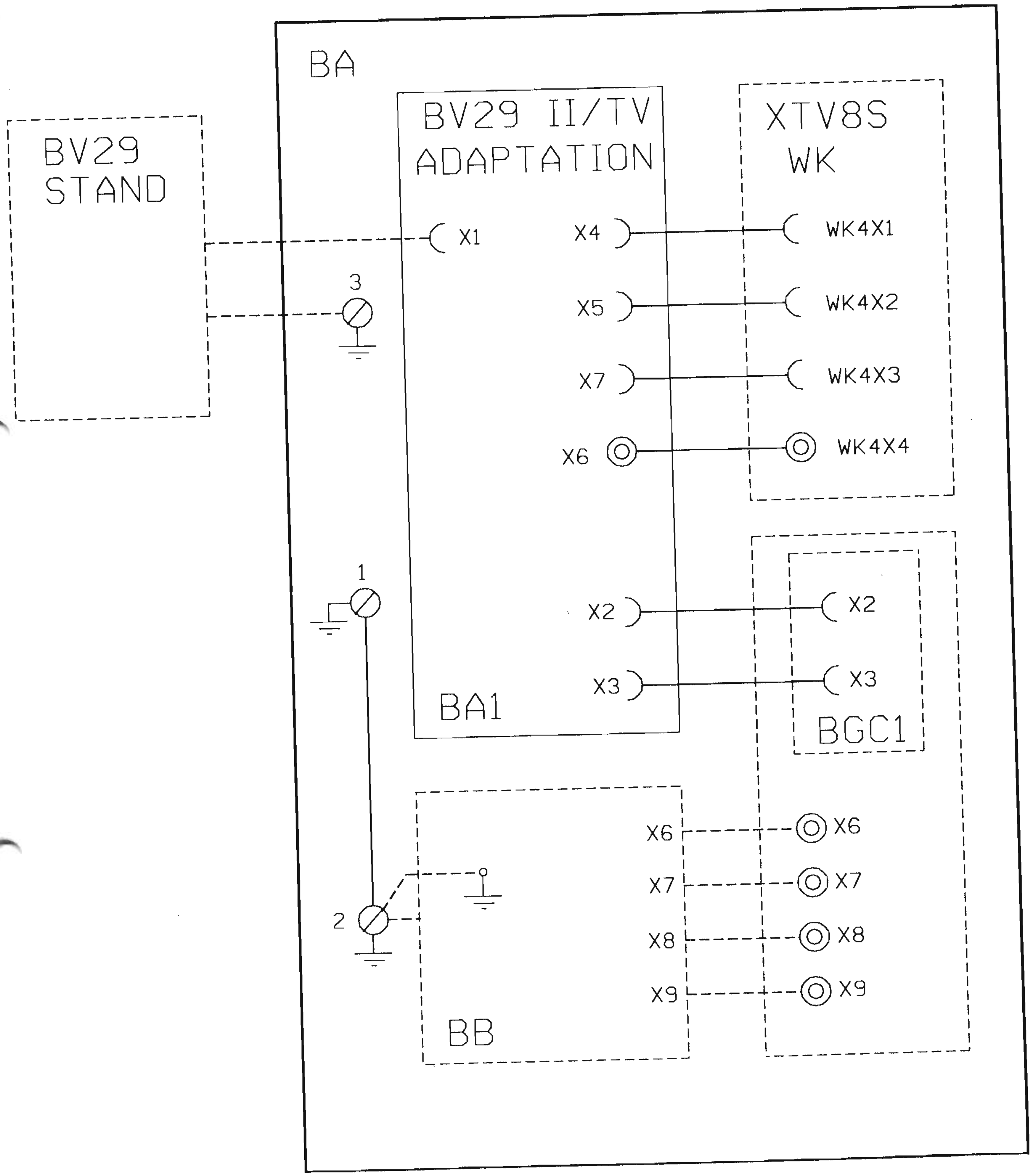


Fig.6, remove the vibration dampers and mount them at the new II-tube.



23cm SHIELD ASSY FOR SURGERY

PHILIPS

Philips Medical Systems

parts list

Philips Medical Systems Nederland B.V. | Technical Service | Best

SERVICE PARTSLIST UNIT

PEI: 9807 603 60001

DESCRIPTION: CASSETTEHOLDER BV29

SERIAL NR:

<u>List of pages and drawings</u>

*printing instructions 4522 983 32271

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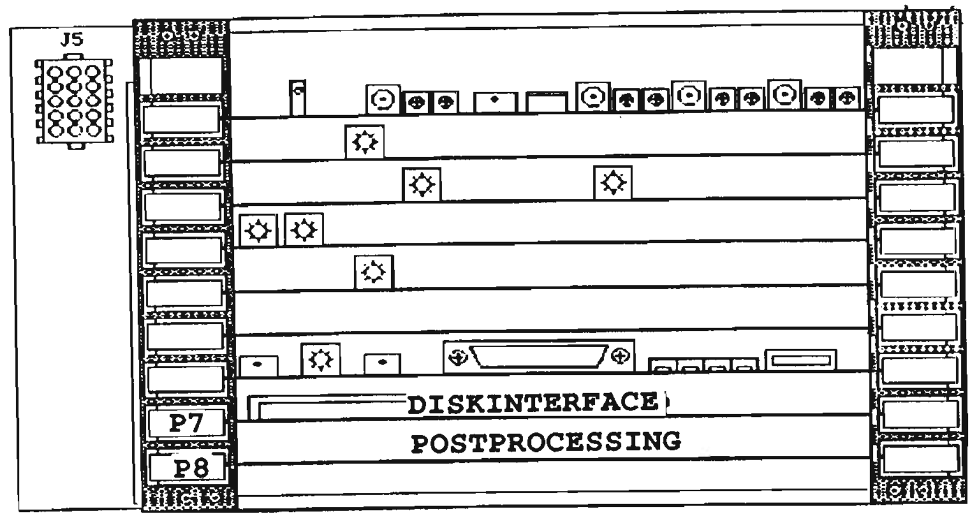
SERVICE PEI MANUALS
BV29 SYSTEM

MODULE CODE NUMBER : 4522 983 52213

LIST OF PAGES AND DRAWINGS

SERVICE MANUAL - UNIT

Image Storage & Handling Extension



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IPSC: Best

IMAGE STORAGE AND HANDLING EXTENSION

SERIAL NUMBER:

LIST OF PAGES AND DRAWINGS

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- Mounting material for Hard Disk:
  (a mounting plate, 4 screws M4 with 4 spring washers, 4 screws M3 with 4 rivets and 4 spring washers and 4 ty-raps.)

3. COMPATIBILITY

The IMAGE STORAGE & HANDLING EXTENSION is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

4.1. MEMORY BOX UNIT TROLLEY

For pulling out the complete Memory Box Unit (MBU) do:

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the MBU half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging of the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out the Memory Box Unit completely (Unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing the 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the blocking screw at the left side, so that the MBU can be pulled out a little bit more to have better access to loosen the EMC-plate covering the location for the Hard Disk.

NOTE

REMOVE THE SCREWS CAREFULLY.

- Remove the EMC-plate covering the location of the Hard Disk (12 screws).

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit completely (Unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing the 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the blocking screw at the left side, so that the MBU can be pulled out a little bit more to have better access to loosen the EMC-plate covering the location for the Hard Disk.

NOTE

REMOVE THE SCREWS CAREFULLY.

- Remove the EMC-plate covering the location of the Hard Disk (12 screws).

4.2. DISK INTERFACE BOARD P7 AND POSTPROCESSING BOARD P8

NOTE

USE ELECTROSTATIC DISCHARGE BRACELET WHEN PUTTING IN THE BOARDS

Procedure:

- Put DISKINTERFACE BOARD on postion P7.
- Put POSTPROCESSING BOARD on position P8.

4.3. HARD DISK (WF)

Procedure:

- Mount the HARDDISK on the mounting plate with 4 screws M3, 4 rivets and 4 spring washers.

NOTE

BEFORE MOUNTING THE HARDDISK MAKE SURE THAT THE INSERTS IN THE 4 VIBRATION DAMPERS ARE CLEAR (NO RUBBER).

THE HARDDISK FLATCABLE CONNECTOR MUST BE LOCATED AT THE LEFT SIDE

- Mount the HARDDISK with mounting plate on the 4 vibration dampers.
  Use the delivered mounting material (4 screws M4 and 4 spring washers).
- Connect cables:
  . WFX1 - WHDP7-J2 (four wire cable)
  . WFX2 - WHDP7-J1 (flat cable)

- Remount the PCB holding plates, both EMC-plates, blocking screw and covers.

5. SETTING TO WORK

- Leave the MMP-unit open.
- Enter the SERVICE MENU.
- Select the MBC UTIL & FREQUENCY menu (line 40).

- Set CHANGE MODE in order to change current settings.
- Put jumper WT2 : S1-5 in position on.
- Select line 43 (Format disk).
- Press <ACC> .
- Give "Y".
- Wait until refreshed menu appears (after 5 sec).
  Text in lower left corner: "FORMATTING DISK"
- Service menu appears after the DISK is formatted.

  RETURN TO MAIN MENU.

  EXIT SERVICE MENU.

  Leave CHANGE MODE.
- Put jumper WT2 : S1-5 in position "OFF".

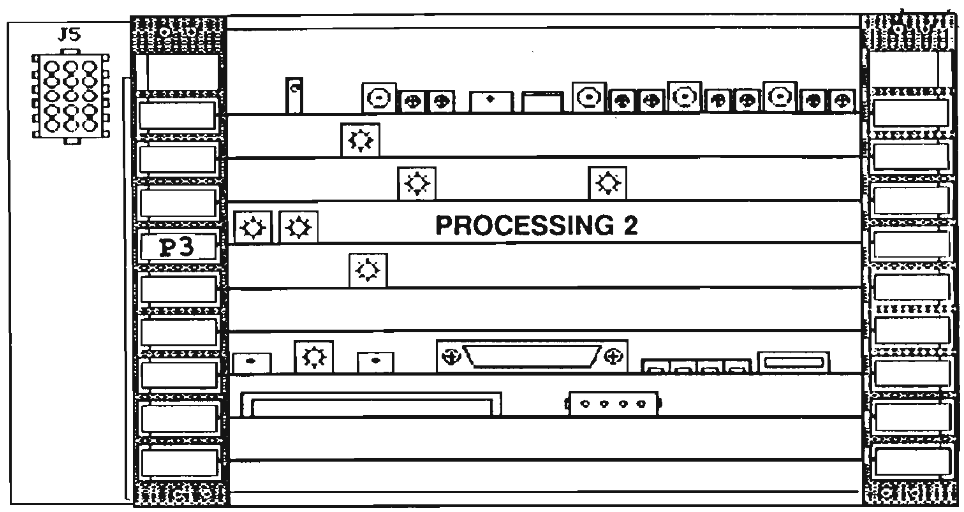
- Push back MMP-unit.
- Tighten the four screws wich holds the MMP-unit.

6. CHECKING THE FUNCTIONS

Check the functions of the IMAGE STORAGE & HANDLING EXTENSION:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

Angiography Extension



This manual contains information on the ANGIOGRAPHY EXTENSION option.

IPSC: Best

ANGIOGRAPHY EXTENSION

SERIAL NUMBER: 1131227Ø

LIST OF PAGES AND DRAWINGS

0.5	(92.0)
1	(92.0)
2.1	(92.1)*
1-1	(92.0)E
1-2	(92.1)E*
1-3	(92.1)E*

Printing instructions: 4522 983 52611

Section : ANGIOGRAPHY EXT.

Contents

1. INTRODUCTION

The IMAGE STORAGE AND HANDLING EXTENSION offers the following functions:
- Storage : 190 images on hard disk.
- Mosaic : displaying of 16 images from hard disk simultanuously.
- Zoom : increasing the area of intrest.
- Measure : indicating the relative difference in vessel diameter of two selected cross sections.

2. ITEMS SUPPLIED

The following items are part of the delivery:

- NEC 3.5-in. Disk Drive.
- Digital Scopofix MMP Diskinterface board P7.
- Digital Scopofix MMP Postprocessing board P8.
- Cabling for connection between:
  WFX2 - WHDP7J1 (flatcable)
  WFX1 - WHDP7J2 (four wire cable)
- Mounting material for Hard Disk:
  (a mounting plate, 4 screws M4 with 4 spring washers, 4 screws M3 with 4 rivets and 4 spring washers and 4 ty-raps.)

3. COMPATIBILITY

The IMAGE STORAGE & HANDLING EXTENSION is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit (MBU) half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the -dummy- PROCESSING 2 BOARD on position P3.
- Place the PROCESSING 2 BOARD on position P3.
- Exchange the footswitch with the delivered footswitch.

- Reassemble in reverse order.

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Remove the -dummy- PROCESSING 2 BOARD on position P3.
- Place the PROCESSING 2 BOARD on position P3.
- Exchange the footswitch with the delivered footswitch.

- Reassemble in reverse order.

5. SETTING TO WORK

NOTE

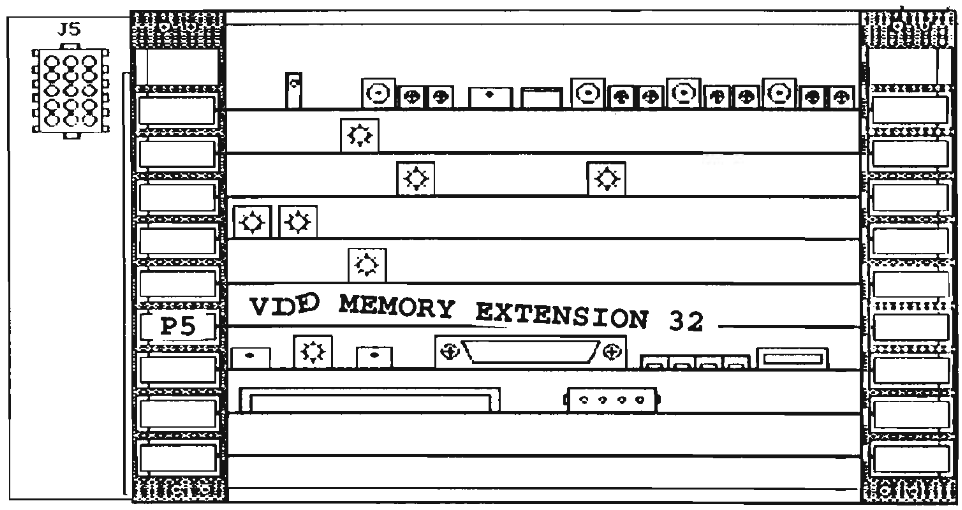
NO SETTING TO WORK INSTRUCTIONS HAVE TO BE CARRIED OUT AFTER INSTALLATION OF THIS OPTION.

6. CHECKING THE FUNCTIONS

Check the functions of the ANGIOGRAPHY EXTENSION:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

Video Memory Extension for ~~32~~ 128 Images



This manual contains information on the VIDEO MEMORY EXTENSION FOR 32 IMAGES option.

IPSC: Best

VIDEO MEMORY EXTENSION FOR ~~32~~ 128 IMAGES

SERIAL NUMBER: 1131220 6

LIST OF PAGES AND DRAWINGS

Printing instructions: 4522 983 52621

VIDEO MEMORY EXTENSION FOR 32 IMAGES

Contents

1. INTRODUCTION

The VIDEO MEMORY EXTENSION FOR 32 IMAGES offers the following functions:
- 32 image video memory for cine display.
- Replay last FLUORO scene.
- Selectable acquisition frame speed.
- Cine loop editing.

2. ITEMS SUPPLIED

The following item is part of the delivery:

- Digital Scopofix MMP CINE MEMORY BOARD P5.

3. COMPATIBILITY

The VIDEO MEMORY EXTENSION FOR 32 IMAGES is compatible with:

MMC 1102 (BV29)
MMC 1151 (BV26)

4. INSTALLATION

Procedure BV26:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out the Memory Box Unit (MBU) half way.
- Disconnect the connectors WTX1 + earth, WTX3, WTX2 and WTX4 to prevent damaging the cables.
- Position the cables so that they can't be damaged when the MBU is pulled out completely.
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Place the CINE MEMORY BOARD on position P5.

- Reassemble in reverse order.

Procedure BV29:

- Remove covers located at both sides of the trolley-keyboard (4 screws each side).
- Pull out MBU completely (unit is secured by blocking screws).
- Remove the EMC-plate at the left side of the MBU by removing 20 screws.
- Remove the 2 PCB holding-plates (4 screws).
- Place the CINE MEMORY BOARD on position P5.

- Reassemble in reverse order.

5. SETTING TO WORK

NOTE

NO SETTING TO WORK INSTRUCTIONS HAVE TO BE CARRIED OUT AFTER INSTALLATION OF THIS OPTION.

6. CHECKING THE FUNCTIONS

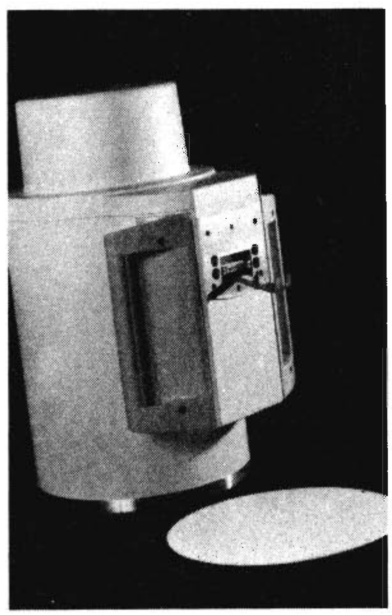
Check the functions of the VIDEO MEMORY EXTENSION FOR 32 IMAGES:
SEE THE USER's MANUAL.

SERVICE MANUAL - UNIT

23cm shield assy for surgery

9896 010 02311

For serial numbers, see list of pages and drawings



This manual contains descriptive information on the equipment identified by the number stated above. For information on specific application, see the system manual.

IPSC: Best

SERVICE MANUAL-UNIT
23cm shield assy for surgery
TYPE NO. : 9896 010 02311

SERIAL NO. :

Manual codenumber : 4522 983 54411

List of Pages and Drawings

Contents

1. INTRODUCTION AND TECHNICAL DATA

1.1. PURPOSE

This 23 cm II tube assembly is applied in the BV29 system. The shield has been designed for housing; a 23cm II-tube, a basic lens, an XTV-8SRI camera, an adaptation board and an II-generator in the II side box.

1.2. ITEMS SUPPLIED

The numbers in the list refer to the items in figure (a) on page 25.

1. shield with side box
2. camera cover
3. couple-plate
4. hand-grip (2x)
5. pressure ring
6. finishing ring with implosion plate, μ-metal ring + lead ring
7. vibration dampers
8. BV29 II/TV adaptation board BA1

In plastic bag:
- 4 screws M4 x 10 for mounting a grid on the finishing ring.
- 4 identification plates, see info at para. 1.3.

cabling set (6 cables) as shown on drawing Z2-1.

1.3. EQUIPMENT IDENTIFICATION

The identification plates are located on the central labelling station of the system and on the inner side of the camera cover as indicated on page 25. Included are the following plates:

- Name and Address plate.
- Manufacturer plate.
- HHS date of manufacture.
- Type number plate with serial number of the 23 cm II tube assy
- HHS certification label.
- UL/CSA classification mark.

NOTE

In case of replacement of certifiable items always replace duplicate label on the inside of the camera cap and on the central labelling station "i" of the BV29.

1.4. TECHNICAL DATA

1.4.1. Dimensions and weights

Overall dimensions: see drawing Z9-1, total weight: ≈ 200 N = ≈ 20 kg.

1.4.2. Protections

X-Rays	The shield, camera cover and other relevant parts are provide with a lead lining to protect the environment against radiation of x-ray beams which are projected perpendicular to the entrance screen
Magnetic shielding	The shield is provided with μ-metal to minimize the effect of weak alternating or static magnetic fields inside the container. All parts of the shield are made of non-magnetic material.
Mechanical	In case the II tube implodes, an implosion plate protects the environment against fragments of the tube.

1.4.3. Compatibility

The 23cm shield assembly for surgery is compatible with the following items:
- 23cm II-generator non blanking
- 23cm II-tube
- XTV-8SRI camera
- mobile surgery stand BV29

1.4.4. Adaptations

The 23 cm II tube assembly can be adapted to the following equipment, which are no part of this assembly:

Mobile stand BV29	The couple-plate is the interface between the BV 29 Stand and the shield assembly. The cable of the stand leading to the shield has to be fitted to the connector X1 of the II/TV adaptaion board BA1 on the couple-plate and to the earth point on the cable relief bracket.
XTV-8SRI camera	the basic lens is fitted to the II-tube with three adjusting bolts in the centring ring. The XTV camera can be mounted directly to the basic lens with a quick locking device.
II compact generator	Can be mounted in the II side box.
23 cm multi mode II-tube	The II-tube must be fitted in the container in one position (markers are on the shield and on the tube).
Grid	The grid is screwed to the front of the container.
Service phantom plate	After removing of the grid a phantom plate can be fitted in two positions (90° rotated) to the front of the container.

1.4.5. Applicable standards

The following standards are applicable to the 23 cm II tube assembly.

PMS products are developed and manufactured with observance of a number of directives, regulations and standards. (e.g. International product safety standards as IEC, ISO, CISPR and national performance and product safety as 21CFR Subch. H and J, U.L., CSA, DIN and VDE.)
Information regarding the compliance status with standards and product approvals is obtainable at:

Philips Medical Systems
Corporate Quality Department
Regulation and approbation Group
Building QM 118
PO Box 10,000
5680 DA BEST
The Netherlands
Fax. No. : 31-40-762205/762420
Tel. No. : 31-40-762408
Telex No. : 35000 PHTC NL
routing indicator XLQBUXA

2. INSTALLATION

Normally the shield-assy is delivered in a factory assembled and -adjusted II/TV-subsystem and no mechanical adjustments are required in the field.

2.1. TOOLS

This assembly can be installed with a standard toolset.

3. REPLACEMENTS

3.1. REMOVE THE SHIELD ASSY FROM THE STAND

(1) move the shield assy towards the stand (+ 90° skew), the X-ray tank is pointing in the air now
(2) support the X-ray tank (with a table or a chair) in such a way that you can not move the C-bow

Warning

When the shield assy is removed there is a large force (from the X-ray tank) pointing in the air. Support the X-ray tank for your own safety.

(3) remove the top cover from the shield
(4) disconnect all the cables from the II/TV adaptation PCB
(5) remove the two hand grips from the shield
(6) disconnect WK4: X1, X2 and X3 from the camera, loosen the camera locking devise and remove the camera from the basic lens
(7) remove the 6 screws from the couple-plate see Fig.1 page 26

3.2. EXCHANGING THE II/TV ADAPTATION PCB (BA1)

(1) execute paragraph 3.1.
(2) remove the plastic cover infront of the PCB (2 screws)
(3) remove the PCB from the couple-plate (4 screws) see Fig.2 page 26
(4) disconnect BA1:X1 from the defective PCB and connect the new PCB
(5) mount the new PCB to the couple-plate and the plastic cover to the PCB
(6) execute para. 3.5.

3.3. EXCHANGING THE HT II-GENERATOR

(1) execute paragraph 3.1.
(2) disconnect BGC1: X6, X7, X8 and X9 from the HT-unit
(3) remove the HT-unit (3 screws) from the shield see Fig.3 page 26
(4) disconnect BGC1: X2 and X3, connect the cables X2 and X3 to the new HT-unit
(5) mount the HT-unit to the shield (3 screws)
(6) connect BGC1: X6, X7, X8 and X9
(7) execute para. 3.5.

3.4. EXCHANGING THE II-TUBE

(1) execute paragraph 3.1.
(2) disconnect BGC1: X6, X7, X8 and X9 from the HT-unit and the earth lead from BA1
(3) remove the basic-lens from the II-tube (3 screws)
(4) remove the X-ray grid (4 screws)
(5) remove the finishing ring form the shield (4 screws)
(6) remove the ring with implosion plate
(7) loosen the: 3 centre-plates (2 screws each) on the pressure ring, Fig.4 page 26
3 bolts (to unlock the adjusting screws)
3 adjusting screws, see also the top-left Fig. 10 on page 25
(8) remove the pressure ring (7 screws see also the top-left Fig. item 12 page 25)
(9) see Fig.5 page 26 remove the 3 bolts from the shield
(10) remove the shield from the II-tube guide the cables through the cable outlet of the shield
(11) remove the 3 vibration dampers from the II-tube and mount them to the new II-tube
(12) guide the cables of the new II-tube through the outlet of the shield and move the tube into the shield. Fit the tube so that the marker on the tube is in line with the marker on the shield, see the top-right figure at page 25
(13) mount the tube to the shield with 3 bolts, see Fig.4
(14) possition the pressure ring in the shield so that the opening of the ring is in the middle of the side box vasten the pressure ring (7 screws see top-left Fig. item 12 page 25) begin at one side of the opening (of the pressure ring) and move onwards untill you reach the other side of the opening of the ring.
(15) turn the adjustment screws (3) untill you feel a resistance and lock them with the bolt
(16) mount the ring with implosion plate; the finishing ring and finaly the grid to the shield
(17) mount the basic lens carefully to the II-tube (3 screws)
(18) connect BGC1: X6, X7, X8 and X9 to the HT-unit and the earth lead to BA1, see Fig.3 page 26
(19) execute para. 3.5.

3.5. MOUNT THE SHIELD ASSY TO THE STAND

(1) mount the shield assy back to the couple-plate (on the stand), with 6 screws see Fig.1 page 26
(2) mount the camera to the basic lens and connect WK4: X1, X2 and X3 to the camera
(3) mount the two hand grips to the couple-plate
(4) connect all the cables to the II/TV adaptation PCB
(5) mount the top cover to the shield

4. ADJUSTMENTS

Normally the shield-assy is delivered in a factory assembled and -adjusted II/TV-subsystem and no electrical adjustments are required in the field.

4.1. ADJUSTMENT FACILITIES

On the BV29 II/TV adaptation board the following adjustments have to be executed:
- BA1:R1, focusing for 13 cm format
- BA1:R2, focusing for 17 cm format
- BA1:R3, focusing for 23 cm format

The measuring points on this board are:
- BA1:MP1, FSM focusing service mode (cathode voltage for each format)
- BA1:MP2, FSMR focusing service mode reference (0Vref)
- BA1:MP3, Video out signal

4.2. ELECTRICAL FOCUSING ADJUSTMENT

General: Stay out of the primary X-ray during focusing of the II-Generator.

Adjustment procedure:
- remove all the filters between the X-Ray Tube and the II Tube
- mount a 23 cm holder with funk phantoms in front of the II
- select the 23 cm II-format
- connect a multimeter between BA1:MP1 and BA1:MP2 on the Adaptation Board (BA1) in the side-box of the shield.
- switch on fluoroscopy in automatic mode.
- adjust the focusing voltage (VC) of the II-tube to a optimum with potentiometer BA1:R3
- switch off fluoroscopy
- select the 17 cm II-format
- switch on fluoroscopy in automatic mode
- adjust the focusing voltage (VC) of the II-tube to a optimum with BA1:R2
- switch off fluoroscopy
- select the 13 cm II-format
- switch on fluoroscopy in automatic mode
- adjust the focusing voltage (VC) of the II-tube to a optimum with BA1:R1
- switch off fluoroscopy
- note down the focusing-value, (BA1:MP1 and MP2) of each format, on a measuring sheet.

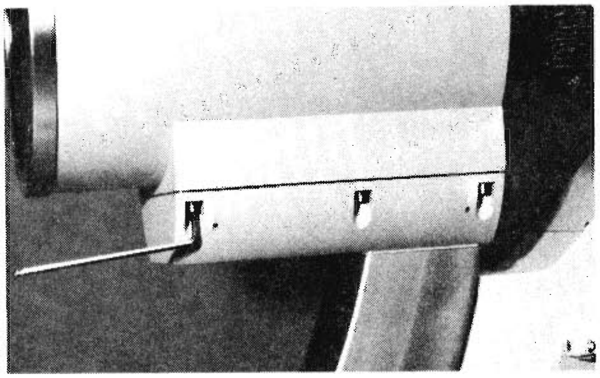


Fig.1 , shield connected to the couple-plate.

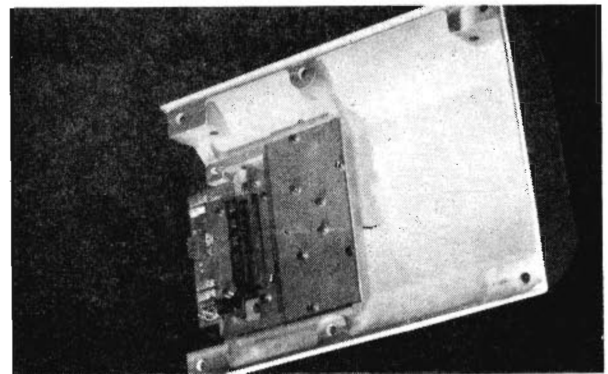


Fig.2 , couple-plate with BA1 board, the plastic cover is already removed.

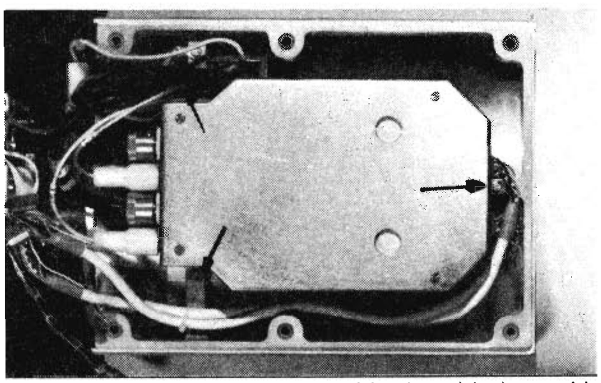


Fig.3 , II-generator mounted in the side box with 3 screws.

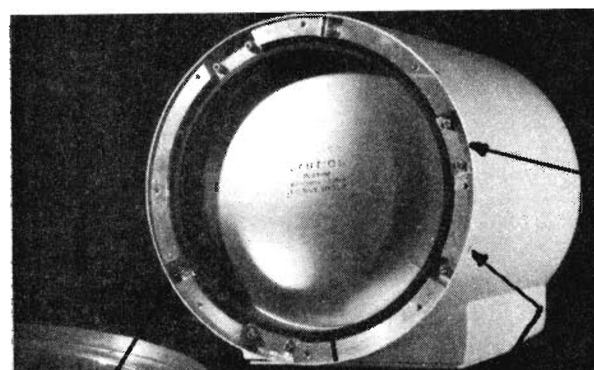


Fig.4 , pressure ring vastened at the side of the shield. see also the centre-plates and the adjustment screws.

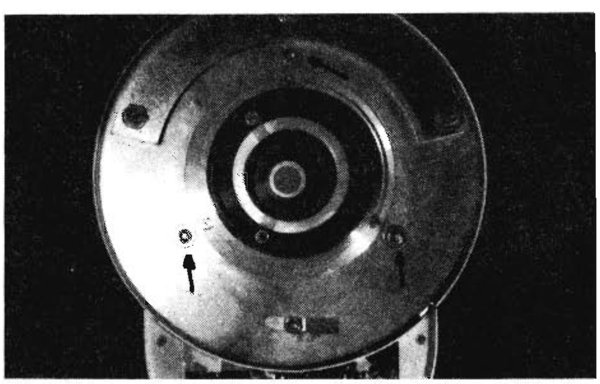


Fig.5 , connection of the II-tube to the shield

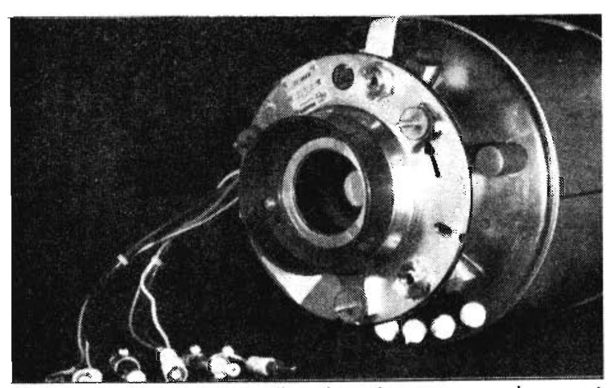
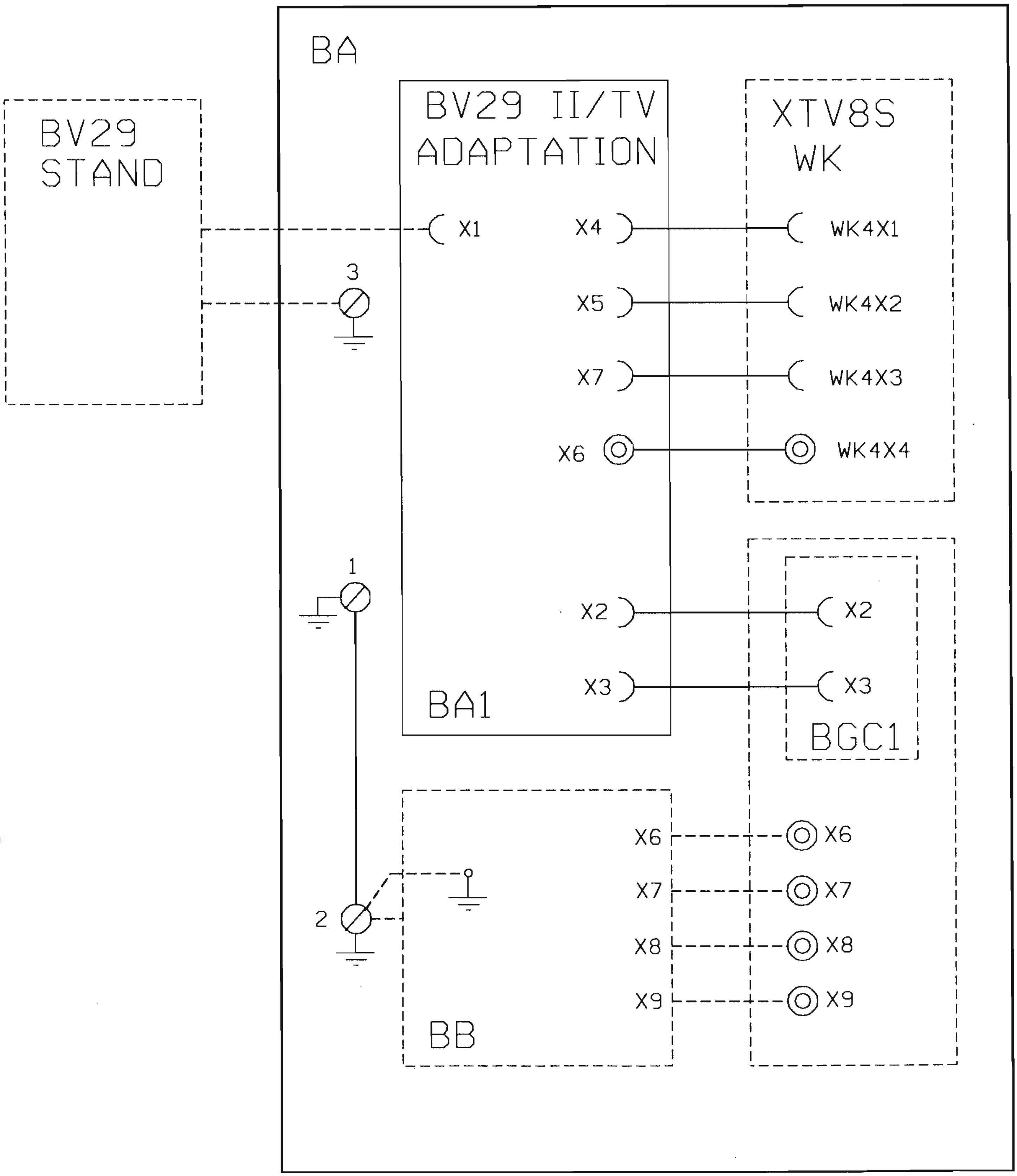


Fig.6, remove the vibration dampers and mount them at the new II-tube.



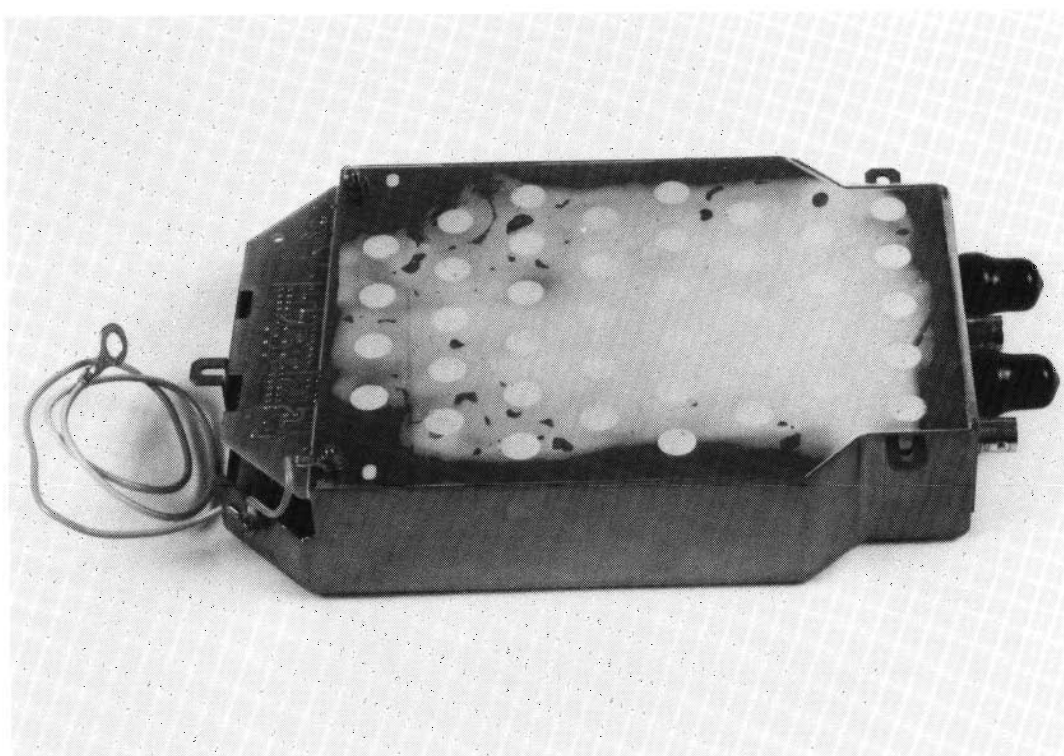
23cm SHIELD ASSY FOR SURGERY

SERVICE MANUAL - UNIT

II GEN. 23CM NON-BLANKING

9807 141 6..01

For serial numbers, see list of pages and drawings



This manual contains descriptive information on the equipment indentified by the number stated above. For information on specific application, see relevant II/TV Subsystem manual.

PMSN Best

SERVICE MANUAL-UNIT
II GEN. 23cm NON-BLANKING
TYPE NO. : 9807 141 61001

SERIAL NO. :

Manual codenumber : 4522 983 18051

List of Pages and Drawings

Contents

1. INTRODUCTION AND TECHNICAL DATA

1.1. PURPOSE

The high tension II-generator, 9807 141 6..01, has been developed to supply the 23 cm single and multi mode 3I II-tubes. The generator consists of a Focus Service Board and a High Tension Cascade Unit. These parts are mounted within the side box of the II-container.

The high tension cascade unit provides the II-tube with the following high tension voltages:

- Anode 1 Voltage VA1 : Constant
- Anode 2 Voltage VA2 : Format dependent
- Focusing 1 Voltage VF1 : Earth potential
- Cathode Voltage VCT : Format dependent (focusing)

1.2. ITEMS SUPPLIED

See page 25

- High tension cascade unit.
- Focus service board.
- Connection cable.
- Mounting material for fitting the high tension cascade unit and the focus service board in the side box of the II-container.

1.3. EQUIPMENT IDENTIFICATION

The location of the identification plates can be found as shown on page 25.

1.4. TECHNICAL DATA

1.4.1. Dimensions and weights

- Dimensions of high tensin cascade unit: L x W x H = 200 x 130 x 50 mm
- Total weight: ~ 30 N = ~ 3 kg.

1.4.2. Electrical data II-generator

The II-generator consists of a cast in high tension cascade unit and a separate focus service board.
All the H.V. output voltages are short circuit proof.

Input data : - Supply voltage: + 15 V ± 5 %, Imax: 0.5 A.
- 15 V ± 5 %, Imax: 0.5 A.

Output data (voltages) :

Connector	II-format	Nominal output
Anode 1 (VA1)	All formats	+ 25 KV ±
Anode 2 (VA2)	23 cm 17 cm 13 cm	+ 8 KV ± + 15.5 KV ± + 25 KV ±
Focus 1 (VF1)	All formats	0 V
Cathode (VCT)	23 cm 17 cm 13 cm	- 275 ± 50 V - 215 ± 50 V - 205 ± 50 V

NOTE

Ionpump voltage not present, external supply needed.

Output data (current) : Imax (Anode 1) = 10 uA
Imax (Anode 2) = 10 uA
Imax (Cathode) = 40 uA

Control signals II-generator - II/TV system

Signal	Code	explanation
II format code 0 II format code 1	IFC0..L IFC1..L	For detailed information see drawing Z1-1
II generator ready	IGRD..L	When the supply voltage of the generator is at an operationel level, IGRD..L will be low active.
Service mode II generator	SMIG..L	Selection of service mode operation of the II-generator for remote focusing.
Service mode focusing	SMFO..A	Cathode reference voltage from a potentiometer in the II/TV system for remote focusing adjustment.

Control signals Focus service board / High tension cascade unit

- Voltage Reference For Cathode Voltage 1 : VREFVC1
- Voltage Reference For Cathode Voltage 2 : VREFVC2
- Voltage Reference For Cathode Voltage 3 : VREFVC3

Connection cable Focus service board - High tension cascade unit

Focus service board	High tension cascade unit	function
BGC2X1 (MOD V)	BGC1X2 (MOD V)	Cathode reference voltages

Switching delay-time

The switching delay-time between the different formats never exceeds 0.8 second.

1.4.3. Environmental data

Ambiënt temperature : + 10 °C / + 40 °C
Relative humidity : + 20 % / + 90 %
Heat emission : 10 Watt

1.4.4. Applicable standards

PMS products are developed and manufactured with observance of a number of directives, regulations and standards. (e.g. International product safety standards as IEC, ISO, CISPR and national performance and product safety as 21CFR Subch. H and J, U.L., CSA, DIN and VDE.)
Information regarding the compliance status with standards and product approvals is obtainable at:

Philips Medical Systems
Corporate Quality Department
Regulation and approbation Group
Building QM 118
PO Box 10,000
5680 DA BEST
The Netherlands
Fax. No. : 31-40-762205/762420
Tel. No. : 31-40-762408
Telex No. : 35000 PHTC NL routing indicator XLQBUXA

2. INSTALLATION

2.1. INTRODUCTION

This section contains general mounting instructions and programming data. For installation information relating to the specific II/TV subbsystem interfaces, see the relevant II/TV subsystem manual.

2.2. TOOLS

The II-generator can be installed with a standard toolset.

2.3. MOUNTING MATERIAL

Mounting material for fitting the high tension cascade unit to the mounting plate in the side box of the II-container:
- 3 washers 3.2 x 7
- 3 spring washers 3.1 x 6.2
- 3 screws M3 x 8

Mounting material (see page 25) for fitting the focus service board to the mounting plate in the side box of the II-container:
(a) 4 washers 2.7 x 6.5
(b) 4 spring washers 2.6 x 5.1
(c) 4 screws M2.5 x 20
(d) 16 print supports
(e) 1 bracket
(f) 2 screws M4 x 6

2.4. INSTALLATION INSTRUCTIONS

The high tension cascade unit has to be fitted together with the stand cabling or a special cable harness to a mounting plate in the side box of the II-container. Use the mounting material as mentioned in paragraph 2.3.

Depending on the system, use one of the two mounting possibilities of the focus service board to the mounting plate in the side box of the II-container. If both possible, use possibility number 1.

(1) To the inside of the 34p M block frame opposite the 34p M block for the TV camera. Use mounting material (a),(b),(c) and (d).(see paragraph 2.3.)
(2) Opposite the ornamental hose inlet. Use mounting material (a),(b),(c),(d),(e) and (f).(see paragraph 2.3.)

The installation instructions and all data concerning the electrical connections of the II-generator are given in the relevant II/TV subsystem manual.

NOTE

Be sure that the protection cover remains on the VA2 plug BGCX7 when the II-generator is used for a single mode II-tube.

3. SETTING TO WORK

3.1. INTRODUCTION

The output voltages of this 23 cm II-generator are factory adjusted (the potentiometers BGC1:R1/R2/R3/R4 has been sealed), with the exception of the cathode voltage VCT for each II-format. The cathode voltages must be adjusted in an operational X-ray system. Instructions concerning the adjustments, see the relevant II/TV subsystem manual.

3.2. TEST EQUIPMENT

DIGITAL MULTIMETER:	RI $\geq$ 10 MOHM V_{DC} ACCURACY $\geq$ 0.5 % 4 DIGIT

3.3. ADJUSTMENT INFORMATION

- Cathode voltage adjustment information (focusing).

The signal SMIG..L is used by the II/TV system to place the II-generator in the service mode. When active, the internal reference of the VCT supply is disabled and a single potentiometer in a control unit of the II/TV system in the II/TV cabinet is used for remote focusing of all available II-formats.
The final focusing is done by copying of the value measured for each II-format during remote focusing to the corresponding potentiometer on the focus service board. The value for each II-format measured on point BGC2: MP1-MP2 is an input cathode reference voltage for the actual cathode voltage VCT. The actual cathode voltage cannot be measured.

3.4. SERVICE CONTROLS AND MEASURING POINTS

- Adjustment facilities on the focus service board BGC2.

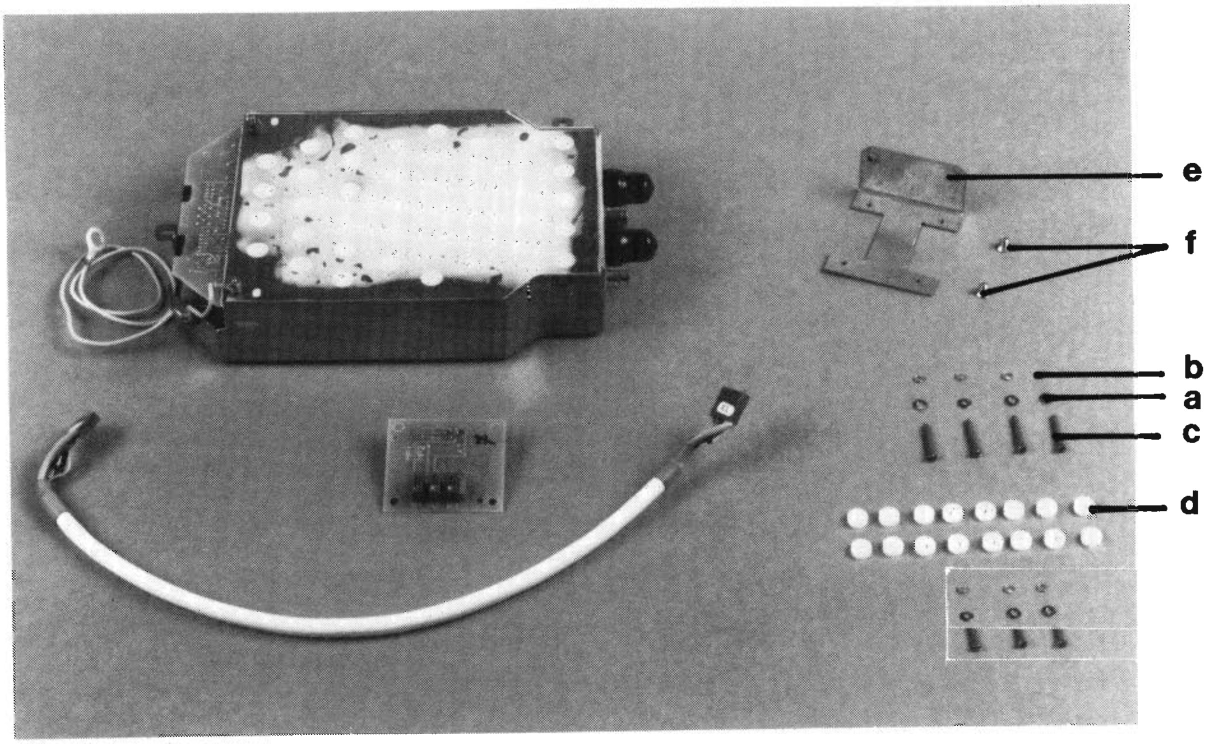
  BGC2:R1 adjustment cathode voltage (13 cm)
  BGC2:R2 adjustment cathode voltage (17 cm)
  BGC2:R3 adjustment cathode voltage (23 cm)

- Measuring points on the focus service board BGC2.

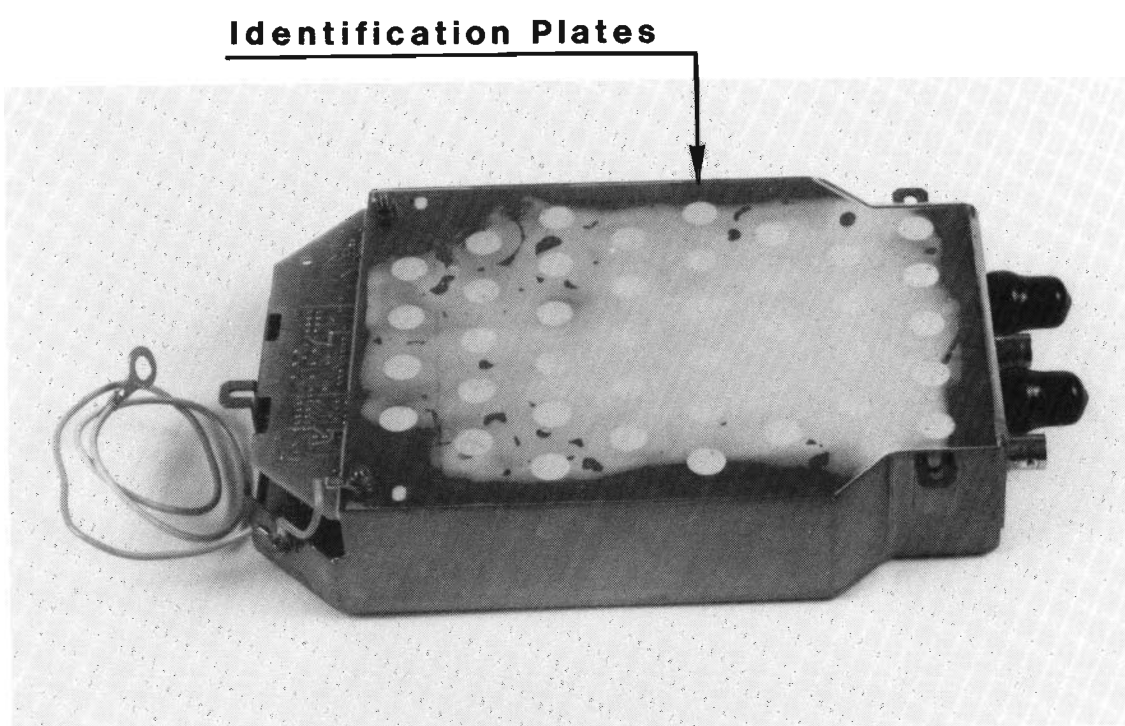
  BGC2:MP1 FSM : focus set monitor (cathode ref. voltage for each II-format)
  BGC2:MP2 FSMR: focus set monitor return (0 Vref)

4. CORRECTIVE MAINTENANCE

The high tension cascade unit is not repairable.
If it is defect, order a new II-generator by the commercial department.

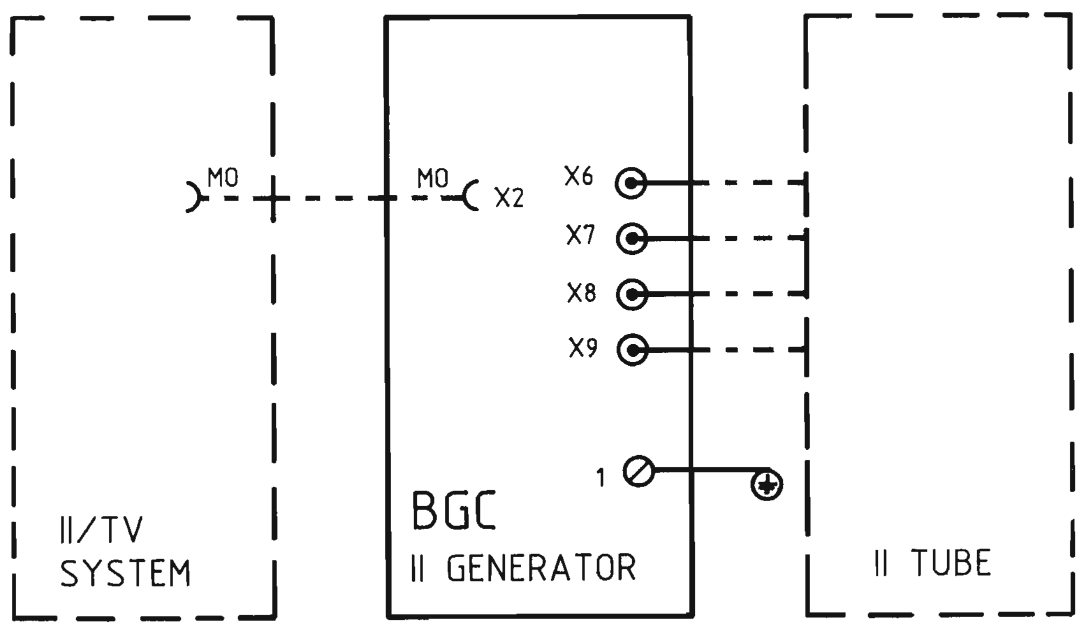


ITEMS SUPPLIED



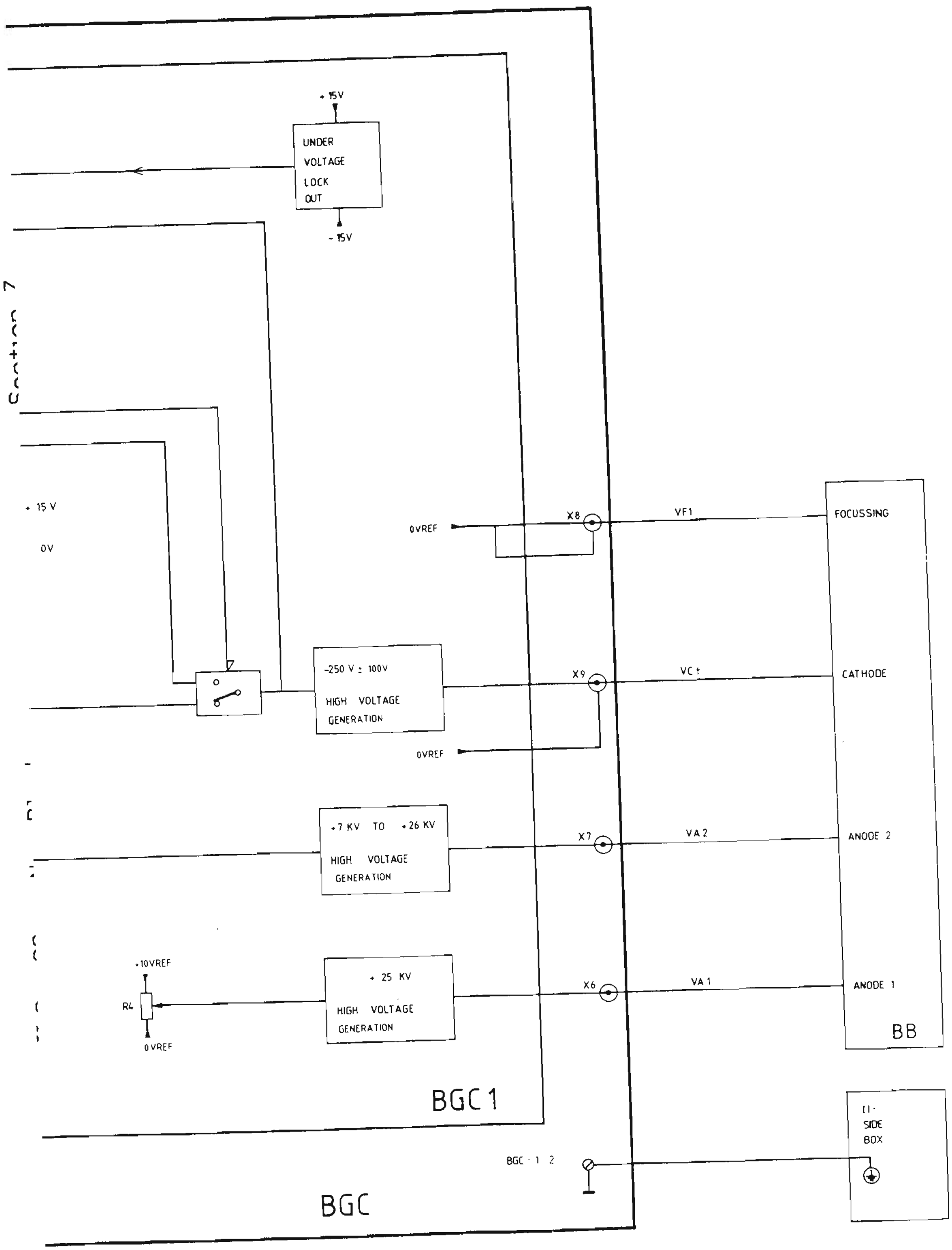
EQUIPMENT IDENTIFICATION

II Gen. 23cm ,Non-Blanking

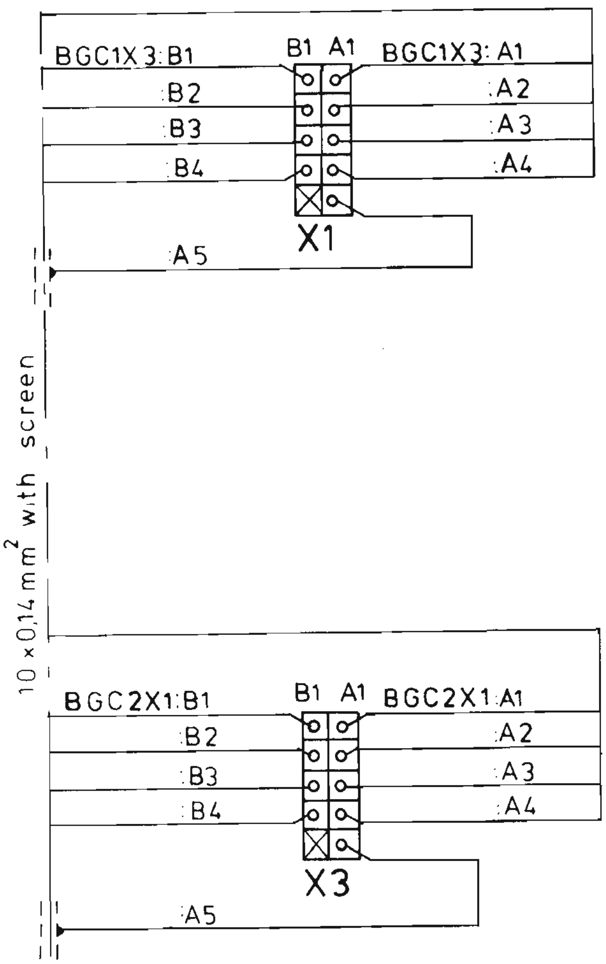


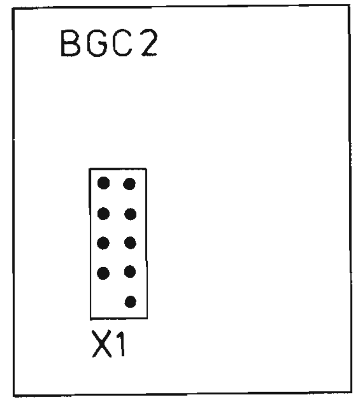
D =DECADE CONNECTOR
MO = MOD V CONNECTOR
⊘ =SCREW TERMINAL
⊙ =HIGH TENSION PLUG
---- =NOT PART OF THIS UNIT

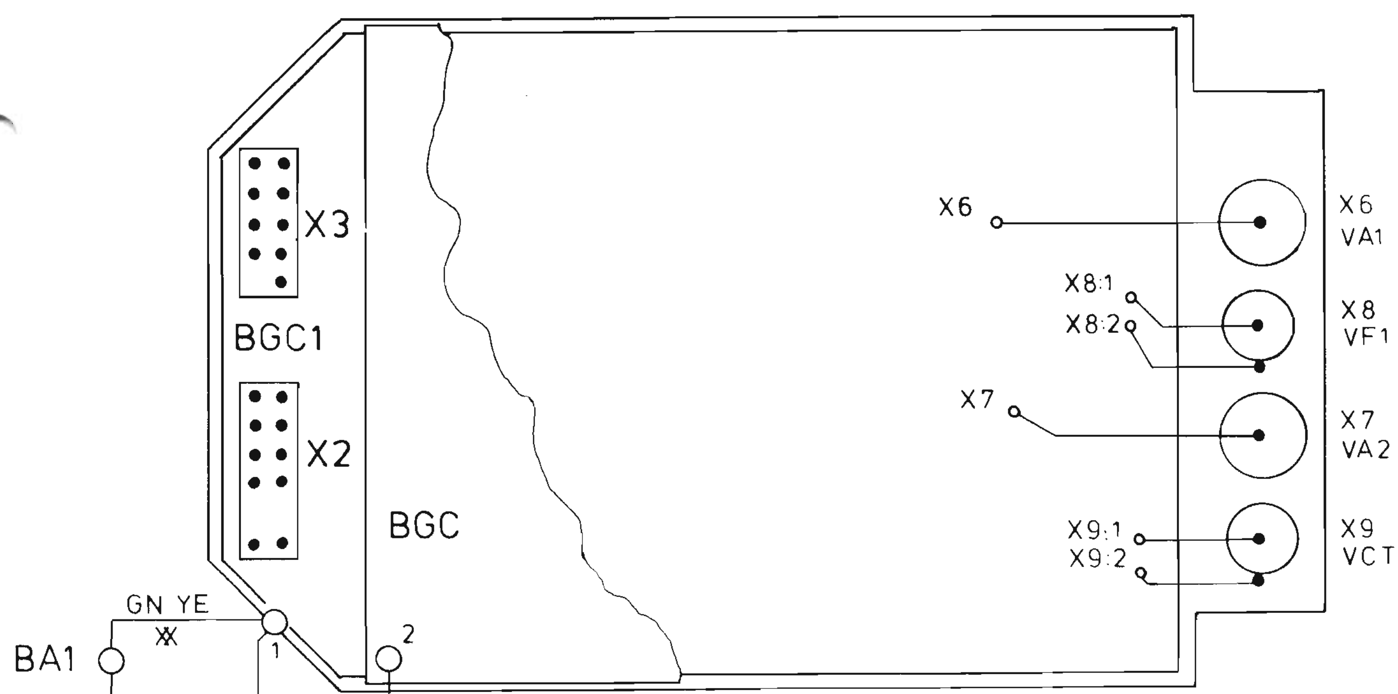
ELECTRICAL INTERFACE
CABLES AND CONNECTORS



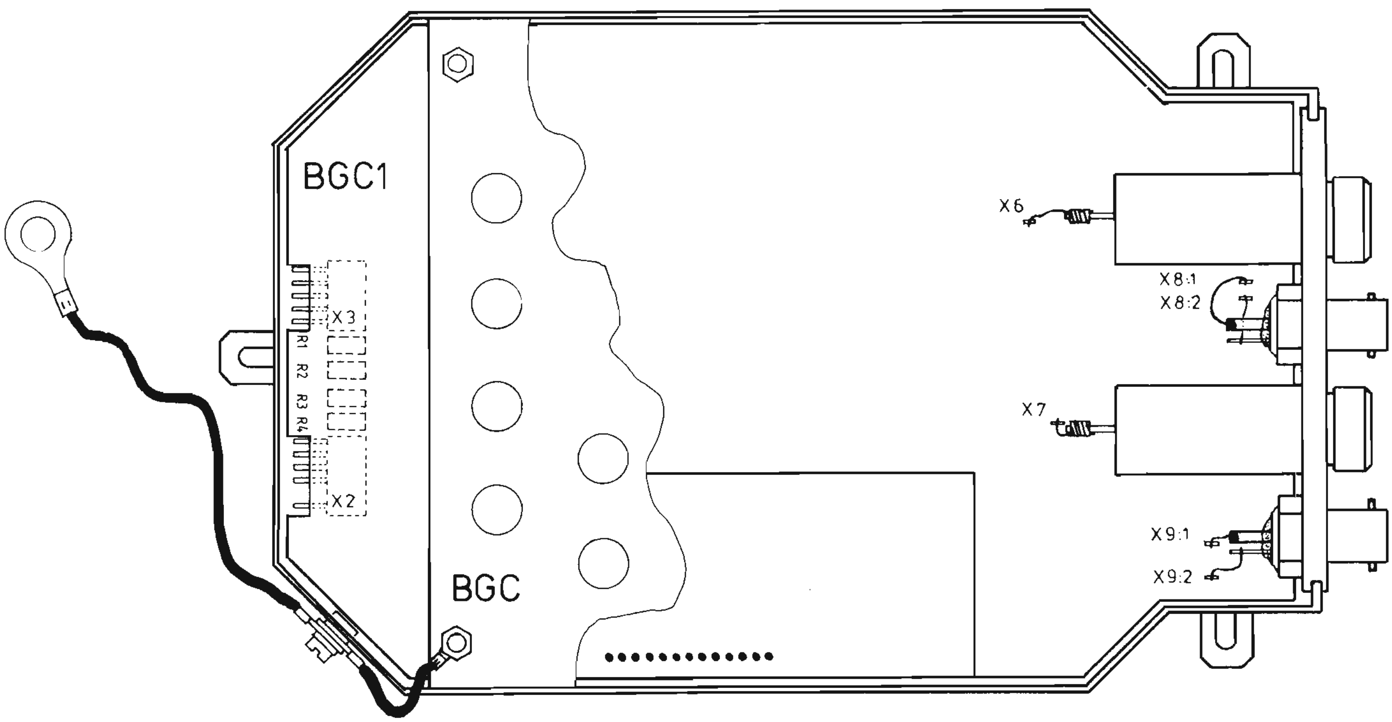
II GENERATOR


BGC1X3:B1
B1 A1
BGC1X3:A1
:B2
:A2
:B3
:A3
:B4
:A4
X1
:A5
10 × 0,14 mm² with screen
BGC2X1:B1
B1 A1
BGC2X1:A1
:B2
:A2
:B3
:A3
:B4
:A4
X3
:A5


BGC2
X1

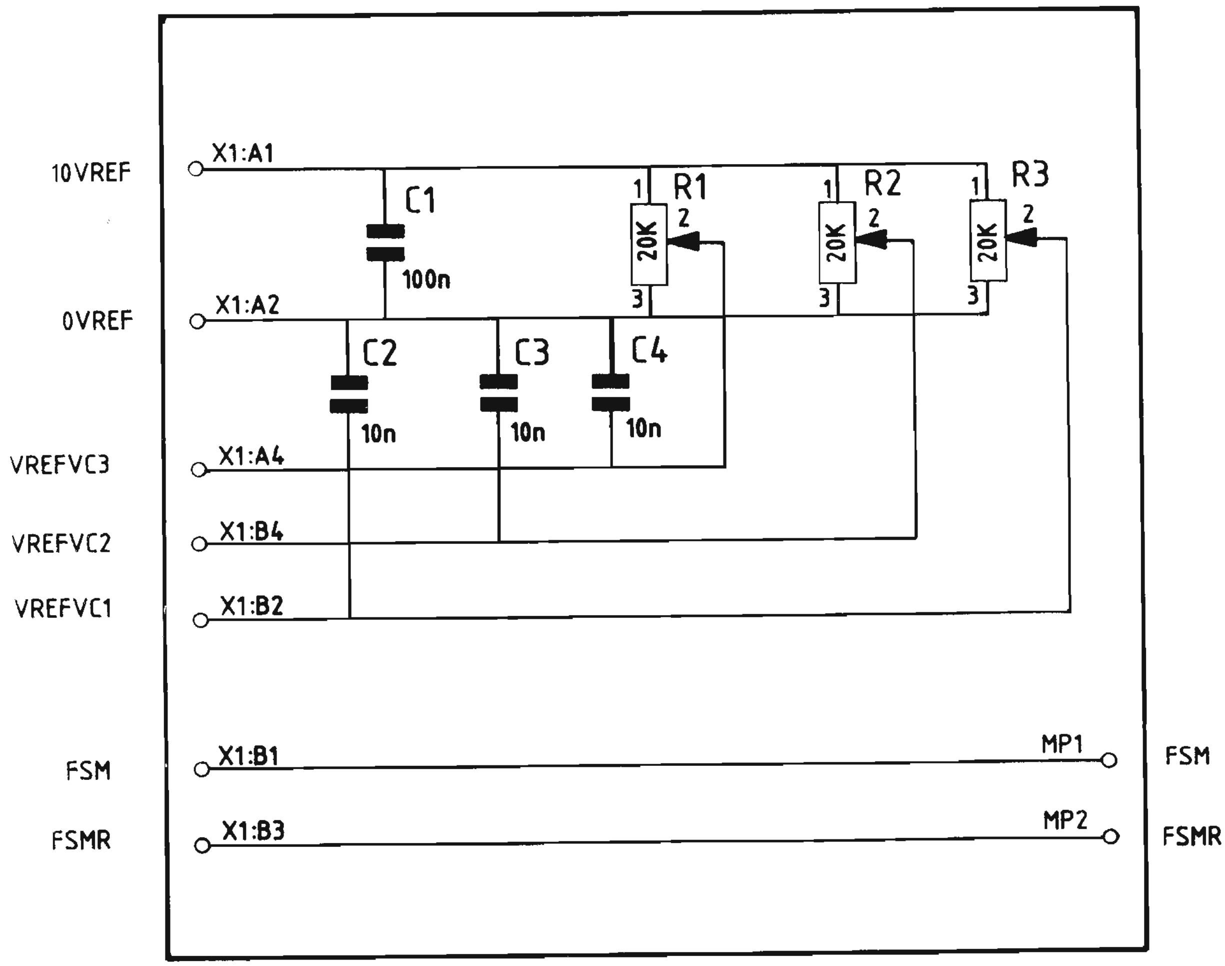

X3
BGC1
X2
BGC
X6
X6
VA1
X8:1
X8:2
X8
VF1
X7
X7
VA2
X9:1
X9:2
X9
VCT
GN YE
BA1
1
2
GN YE

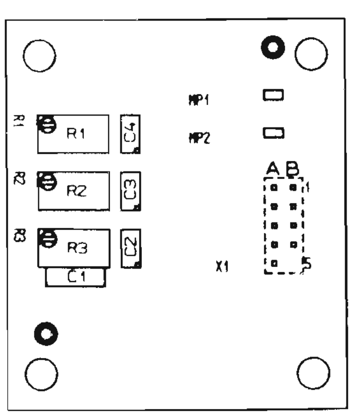
CABLING



BGC(1)

HIGH TENSION CASCADE UNIT





BGC2

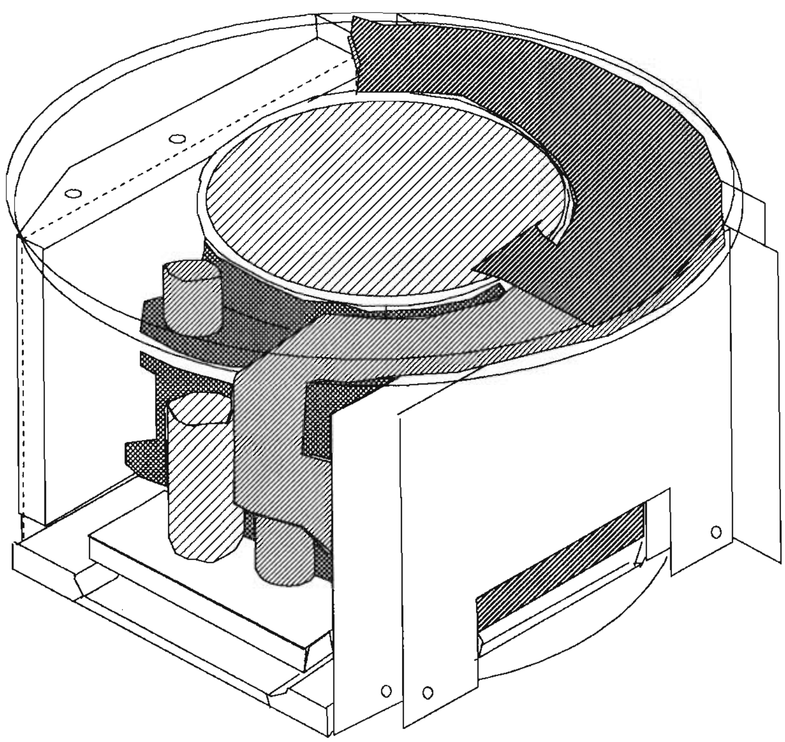
FOCUS SERVICE BOARD 4522 108 09501	

SERVICE MANUAL - UNIT

XTV-8SRI camera

9896 010 022$^{8}_{9}$.

For serial numbers, see list of pages and drawings



This manual contains descriptive information on the equipment identified by the number stated above. For information on specific application, see the system manual.

PMSN Best

SERVICE MANUAL-UNIT
XTV-8SRI camera
TYPE NO. : 9869 010 022$^{8}_{9}$1

SERIAL NO.:

Manual codenumber: 4522 983 53511

LIST OF PAGES AND DRAWINGS

Section 1: Introduction & Technical data

Contents

1. PURPOSE

The XTV-8SRI camera is a major upgrade of the first generation XTV-8 CCD camera. The XTV-8S camera is meant for standard class fluoroscopy examinations in conjunction with:
- 23 cm single channel multi-mode Image Intensifier (for surgery stands)
- 15 cm single channel one mode II (for surgery stands).

1.1. DEFINITION OF TERMS

The following terms/mnemonics are used in this manual:

ADC	Automatic Doserate Control
AGC	Automatic Gain Control
assy	assembly
CCD	Charge Coupled Device
CCIR	European video standard
cw	clock wise
ccw	counter clock wise
DRFLDNA	Doserate Fluoroscopy Differential Signal Negative Analog
DRFLDPA	Doserate Fluoroscopy Differential Signal Positive Analog
EIA	American video standard
II	Image Intensifier
MF	Measuring Field
RC	Remote Control stand
RF	Radiography Fluoroscopy stand
VIAGC	Video after AGC
VIBS	Video with Blanking and Sync. (= composite video out)
VICA	Video from Camera (without sync. before AGC/ADC)

1.2. VERSIONS

The camera will be delivered in 2 versions. The differences between the versions are in the type of video produced.

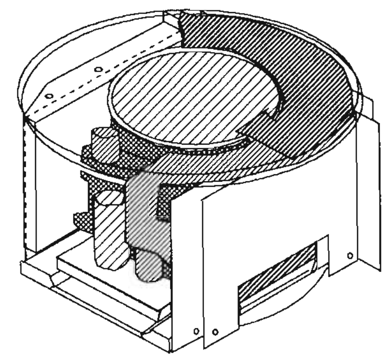
XTV-8SRI/50	50 Hz rotatable camera with iris remote control	9896 010 02281
XTV-8SRI/60	60 Hz rotatable camera with iris remote control	9896 010 02291

The 50 Hz version, produces an CCIR (625 lines interlaced) composite video output.
The 60 Hz version, produces an EIA (525 lines interlaced) composite video output.

1.3. ITEMS SUPPLIED

See the figure

(1) camera SRI version



1.4. EQUIPMENT IDENTIFICATION

Equipment identification is located on the inside of the camera cap and on the central labelling station "I" of the stand.

NOTE

In case of replacement of the certifiable items, always replace the duplicate label on the places mentioned above.

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2. TECHNICAL DATA

2.1. PERFORMANCE DATA

2.1.1. General

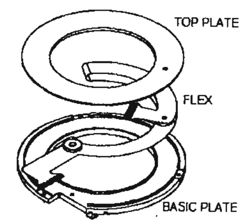
The XTV-8SRI has:

- very good resolution through:
  - a CCD with 750 horizontal pixels
  - optimal use of the CCD sensor area through elliptical projection
- good signal to noise ratio, minimum lag
- service adjustable irisdiaphragm with position detection
- service selectable sync. modes, X-tal/mains lock
- user selectable AGC gain modes; fixed, automatic and locked
- ADC and AGC based on pseudotop-detection in the measuring field
- fixed white compression
- circle blanking
- left/right image reversal (user selectable)
- horizontal contour enhancement
- cable-loss compensation
- very low sensitivity to EM-interference
- a low-energy stand-by mode to reduce the power consumption

The XTV-8SRI major components are:

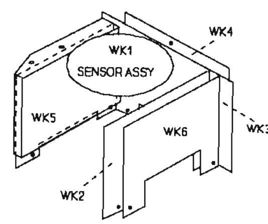
Flex with plates

The rotating flex is guided by a basic-plate and a top-plate.



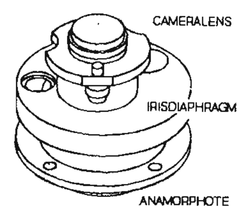
Printed Circuit Boards

WK1 preprocessing 1 (is part of the sensor assy)
WK2 preprocessing 2
WK3 AGC/ADC 1
WK4 AGC/ADC 2
WK5 videoprocessing (this PCB is shielded)
WK6 rotation+iris control



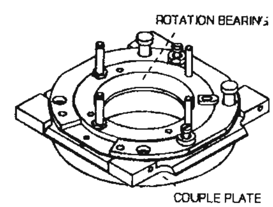
Integrated optics

Is made as one part and contains the following parts:
- cameralens
- anamorphotelens
- irisdiaphragm



Rotation bearing assy

Is the basic part of the camera on wich the other parts are mounted.
It is an assy of the couple plate and the rotating part of the camera



See the Spare Parts list for a detailed replaceable-items guide of this camera.

2.1.2. Optics

Type	: single channel tandem system with an adjustable irisdiaphragm and a prism pair (anamorphote) for vertical image compression
Anamorphote	: vert : hor axis = 3 : 4
Cameralens	: F 1.0/21
Diaphragm	: irisdiaphragm, opening is service adjustable, from 5 to 21.3 mm.

2.1.3. CCD-imaging and preprocessing

Image sensor	: ICX038ALA (EIA), ICX039ALA (CCIR)
Type	: interline transfer CCD, single output register
Effective pixels	: 752 (H) x 582 (V) (CCIR), 768 (H) x 494 (V) (EIA)
Readout mode	: interlaced, frame or field accumulation.

2.1.4. Gain control

Gain modes	: auto gain control (AGC) fixed gain AGC-lock
AGC	: feedforward gain control TOP-2A detection
AGC range	: 0.2 - 8 x, nominal 2 x after stabilisation
Fixed gain range	: 0 - 4 x, nominal adjusted to 2 x
Measuring fields	: circular (can be made visible on the monitor).

2.1.5. Automatic dose control

Detection	: TOP-2
Measuring fields	: same as gain control
Output signals	: DRFLDFPA and DRFLDFNA - 7.5 to + 7.5 V for non-surgery stands (stabilization level = 0 V) 0 to 9 V for surgery stands (stabilization level = 1.5 V)
settings	: there are 3 settings for operating point available (1 fixed and 2 adjustable).

2.1.6. Video output signal (VIBS)

Video standard	: composite video EIA or CCIR
Output impedance	: 75 Ohm
Max. level	: 700 mV or 1100 mV (service selectable)
Sync. level	: - 300 mV ± 30 mV
White compression	: 2 curves
Contour enhancement	: horizontal, function can be set on/off
Video bandwidth	: 10 MHz
Cable loss compensation	: DC and HF-roll off compensation
Sync. modes	: X-tal/mains lock
Clean circle	: can be switched off for service purposes.

2.1.7. Iriscontrol

remote controlled diaphragm for : 1 fluoroscopy position
1 snapshot/boost position (2.4 x area reduction).

2.1.8. Camera rotation

function : image rotation around optical axis
rotation angle : 0 - 290° cw and ccw from zero position
rotation speed : 40°/sec
control signal : 5 V = zero position.

2.2. Dimensions and weight

Dimensions : 115 x 140 x 150 mm (h x w x d)
Weight : 14 N

2.3. Supply requirements

Supply voltages and power consumptions:

+ 15 V DC ± 1 V, max. 7.5 W
- 15 V DC ± 1 V, max. 7.5 W
+ 6.4 V DC + 0.2/- 0.6 V, max 6.5 W

2.4. Environmental data

Ambient temperature in operation : 0° to 40° C
Ambient temperature storage : - 25° to + 70° C
Relative humidity max. : 90 %

2.5. Compatibility

The XTV-8SRI camera is compatible with: the 23cm basic lens and the 15cm basic lens both special made for the XTV-8S and the XTV-8SRI.

The XTV-8SRI camera is compatible with the following mobile surgery stands:
- BV26
- BV29

2.6. APPLICABLE STANDARDS

PMS products are developed and manufactured with observance of a number of directives, regulations and standards. (e.g. International product safety standards as IEC, ISO, CISPR and national performance and product safety as 21CFR Subch. H and J, U.L., CSA, DIN and VDE.)
Information regarding the compliance status with standards and product approvals is obtainable at:

Philips Medical Systems
Corporate Quality Department
Regulation and approbation Group
Building QM-118
P.O. Box 10,000
5680 DA BEST
The Netherlands
Fax. No. : 31-40-762205/762420
Tel. No. : 31-40-762408
Telex No. : 35000 PHTC NL routing indicator XLQBUXA

Section 2: Installation

Contents

1. INTRODUCTION

All the cameras are delivered in a factory assembled and adjusted -II/TV subsystem- and no mechanical or electrical adjustments are required in the field.
If a complete camera is exchanged then follow the adjustments given in the "what to do table" in section 6 of this manual. See also para. 1.4. section 1 of this manual.

Section 3: Fault Finding

Contents

1. FUNCTIONAL INFORMATION

Location of the items mentioned in the tables of the PCB overview are given on the drawing Z3-1.

1.1. WK1 PREPROCESSING 1 BOARD

Item	Name	Function	Remarks
jumpers	-		
switches	-		
measuring points	-		
adjustments	R24 R28 R57 R58	+ 15 V V sub. cross talk compensation gain	NO service adjustment NO service adjustment NO service adjustment NO service adjustment

1.2. WK2 PREPROCESSING 2 BOARD

There are no jumpers, switches, measuring points or potentionmeters on this board.

1.3. WK3 AGC/ADC 1 BOARD

Item	Name	Function	Remarks
jumpers	W1 W2 W3 X19	blockgenerator 1-2 = on; 2-3 = off rampgenerator 1-2 = on; 2-3 = off videoproc. bypass 1-2 = on; 2-3 = off A-B 1 = 3.3 till 10 m } A-B 2 = 10 till 16.7 m } cable A-B 3 = 16.7 till 25 m } compensation other = 0 till 3.3 m }	for surgery program always 0 till 3.3 m (A1-2 or A2-3)
switches	-		

Item	Name	Function	Remarks
measuring points	MP1 MP2 MP3 MP4 MP5 MP6 MP7 MP8 MP9 MP10 MP11 MP12 MP13 MP14 MP15	VIN (video in) VINADJ (video in after first gain) VIAGC (video after AGC) VICOMP (video after white compression) VIDAC (video from the videoproc.) VICORR (video after contour correction) VIBS (video out) IRPOT 1 (irispotentiometer pin 1) IRPOT 2 (irispotentiometer pin 2, slider) IRPOT 3 (irispotentiometer pin 3) video gainmult video after divider DRFLDPA (doserate fluoro 0 Volt Vclamp	
adjustments	P1 P2 P3 P4 P5 P6 P7 P8	ampiltude blockgenerator doserate medium format doserate small format black level fixed gain AGC threshold small MF AGC threshold large MF offset	NO service adjustment

1.4. WK4 AGC/ADC 2 BOARD

Item	Name	Function	Remarks
jumpers	W1	clean circle 1-2 = on; 2-3 = off	
switches	S1:1 S1:2 S1:3	on = surgery; off = RF/RC	
	S2:1	on = X-tal lock; off = mains lock	
	S2:2	on = contour correction on; off = cc off	
	S2:3	on = frame accumulation; off = field accumulation	
	S2:4	on = white compression curve 1; off = curve 2	
	S2:5	on = fixed gain on; off = normal use	
	S2:6	on = 1100mV max. VIBS level; off = 700 mV	monitor depended
	S3:1	on = normal image ; off = image horizontal inverted	
	S3:2	on = ISU 9807 519 10001; off = not used	
	S3:3	on = relative MF value ; off = absolute MF value	
	S3:4	MF rel C0	see the next table
	S3:5	MF rel C1	see the next table
	S3:6	on = MF remote selectable; off = MF local selectable	
	S3:7	on = large MF; off = small MF	only if S3:6 = off
	S3:8	on = AGC soft rise on; off = no AGC soft rise	

measuring points	MP1 MP2	ground ground	
adjustments	-		

NOTE

The MF or the service cross is only visible on the monitor if WK5:S2 is positioned to the right and WK4:W1 in 1-2 (CLCL off).

S3:3 (MF relative/absolute)	S3:4 (MF rel C0)	S3:5 (MF rel C1)	Operation
on on on on	off off on on	off on off on	service cross not used MF for RF/RC MF for BV25/26
off	don't care	don't care	MF for BV29

The large or small MF are selectable with S3:7 (if S3:6 is off). The MF values are given in % of the nominal clean circle size, see the next table. The MF values for BV29 are absolute, in this table they are converted in % of the nominal CLCL size.

		BV25/26	BV29
large MF	9" format 7" format 5" format	- - 50	32 44 50
small MF	9" format 7" format 5" format	- - 30	18 25 30
		[%]	[%]

1.5. WK5 VIDEOPROCESSING BOARD

Item	Name	Function	Remarks
switches	S1 S2	circle blanking size; from 0 till 7, with every step the circle size will increase with 8 lines. (from 8 till F is the same value as from 0 till 7) MF visible on image (only when clean circle is off) right position = on; left position = normal use	only when WK4:W1 = 2-3
measuring points	MP1	midline (sync. pulse on the middle of the video signal)	
adjustments	P1	video gain	

1.6. WK6 ROTAIRIS BOARD

Item	Name	Function	Remarks
jumpers	-		
switches	-		
measuring points	MP1 MP2 MP3 MP4 MP5 MP6 MP7	ground iris position difference iristarget watch dog rotation position difference rotation speed rotation movement enable	
adjustments	P1 P2 P3 P4	irisdiaphragm not used (removed) not used (removed) offset	NO service adjustment

2. Explanations

2.1. The image projection

Function : accurate projection of the image from the II-output screen upon the image area of the CCD sensor.

Therefor three types of lenses are used:

- The basic lens (no part of the camera): collimates the image from the II-output into a parallel beam.
- The anamorphote lens: compresses (3/4) the image in the vertical direction.
- The diaphragm: variates the light intensity.
- The camera lens: project the image on the image area of the CCD sensor.

2.2. Preprocessing 1 and 2

Function : transforming the projected image on the CCD sensor into a pre-amplified sync-less video signal.

The CCD convert the image projected on the sensor into an interlaced video signal. There are 2 video modes (both interlaced): frame accumulation (even line field + uneven line field = 1frame in 40ms) and field acummulation (readout of the complete image area of the CCD within 20ms).
Z1-1 gives a simplified diagram of the preprocessing. With on WK1 a 50/60 Hz pcb identification so no programming neccessary. On WK2 the video signal will be clamped on the black CCD pixels. After clipping and blanking the video signal (VICA) goes on to the AGC/ADC PCB.

2.3. AGC/ADC 1 and 2

Function : produce an X-ray Doserate control signal for the X-ray generator (ADC) and analog processing of the video signal to optimize its amplitude range and frequency spectrum (AGC and white compression).

New in this camera is the doserate-adjustment for large format, VICA will be amplified with a fixed value (the value for BV29 is not the sames as for BV26). See Z1-2.
So the doserate for large format is only adjustable through varing the irisdiaphragm, set the doserate to the wanted value (see system manual for conditions), measure the doserate signal MP13 and adjust it (with the irisdiaphragm) to 1.5V. In case of a BV29 the doserate for the other formats can be adjusted (the irisdiaphragm is fixed now) through changing the amplification factor. Measure MP13 and adjust it with P2 and P3 (format depended) to 1.5V.

The ADC consists of a: top 2 detection (almost true top) of the video signal within the measuring field; sample /hold stores the video value untill the next video line is measured; Amplifier with the output signal DRFLDF (stabilization level = 1.5V for each format).

The AGC consists of a: top 2A detection (slow top integration); Sample/hold; Feed forward amplifier (1/x ampl. and a multiplier) AGC threshold adjustable for the two measuring fields (P6 and P7). Fixed gain adjustable (P5).

The white compression converts high (white) video signal to a level given in Fig. 1.

The following items are located on the AGC/ADC 2 pcb:
- all the in/out-put signals from/to the stand
- almost all the switches (configuration setting included)
- supplies.

See Z1-2

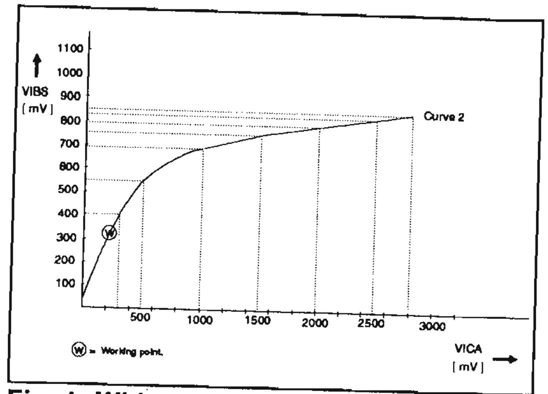


Fig. 1: White compression curve

2.4. VIDEO PROCESSING

Function : The video processing compresses the image horizontaly to get a normal circle shape.

The analog video will be converted to an 8 bit digital signal. Then the signal will be compressed via a buffer (written with 14 MHz readout with 19 MHz) and converted to an analog signal.
The circle generator delivers start/stop signals for: the circle blanking (adjustable with S1); the measuring fields and for the horizontal image reverse.

2.5. VIDEO OUT

Function : makes video ready for use (monitor or video processing unit)

After the video processing (we are back on the AGC/ADC1 pcb) a contour correction is possible (can be programmed on WK4). The video signal will be clamped once more and a black level is added to the video signal (adjustable with P4).
When there are no exposures made and the fluoroscopy is switched off the camera is in the standby mode that means all voltages with the mnemonic sw (switched) are switched off. When fluoroscopy or exposure is enabled or the clean circle is switched off, the voltages are switched on again and within 20ms the clcldelayed switches over to normal video instead of setup clcl.
Then the circle blanking and the sync. will be added. The cable lenght compensation is only needed for RF/RC stands, for surgery the jumper must be set in a parking position.

2.6. ROTATION AND IRIS CONTROL

Function : to control the rotation motor and the irisdiaphragm motor

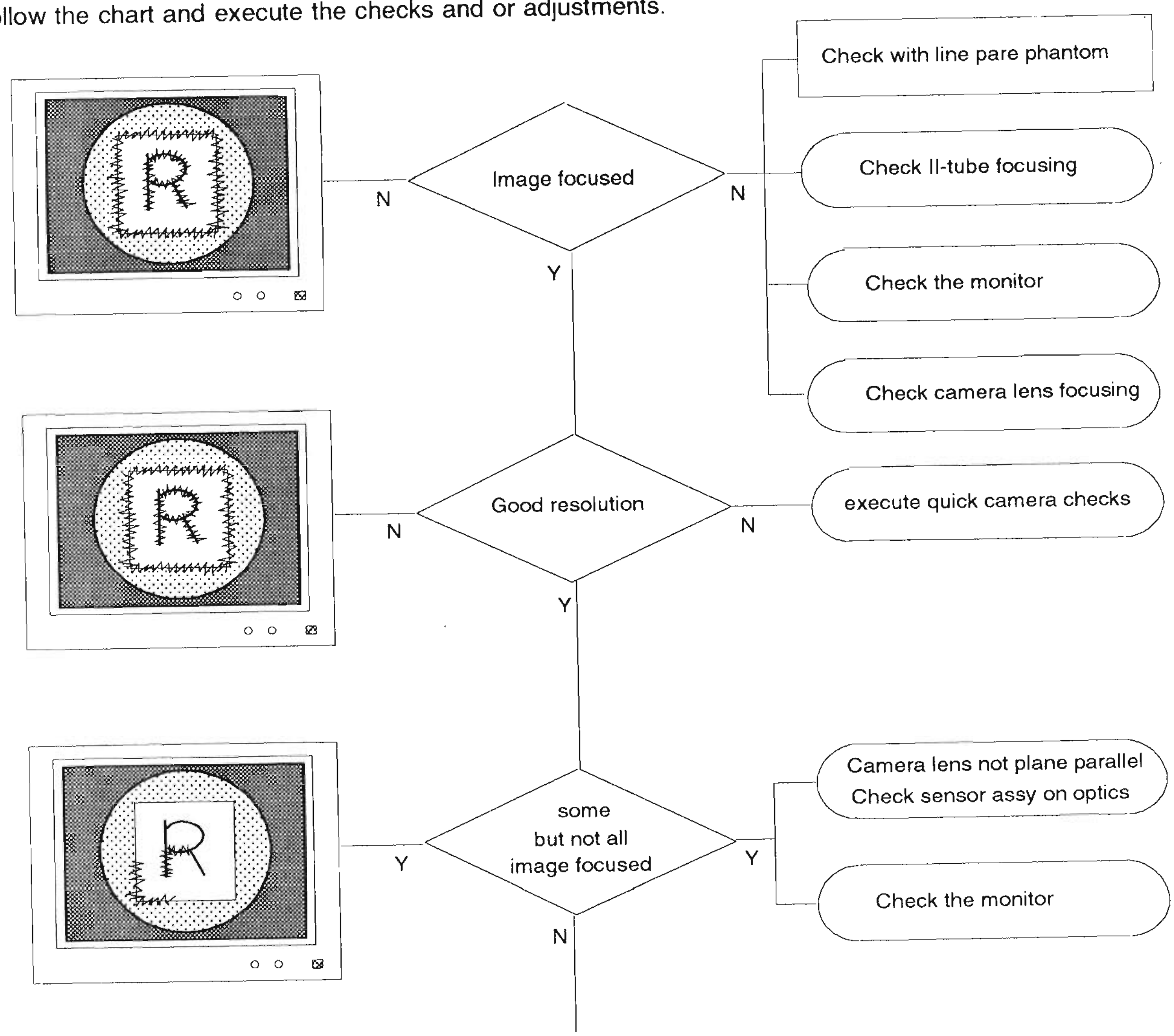
Are located on the rota-iris board WK6, see Z1-1. The rotation commands are comming from the stand, the motor is controlled via the target position, movement regulation and the power control.
The rotation assembly (motor and potentiometer) is via X12 directly connected to WK6.
The iris opening for fluoroscopy can be adjusted with P1. The other iris positions can be controlled by the stand. The iris control is the same as the rotation control. The iris motor and potentiometer are via WK1-flex-WK2-WK3 connected to WK6.

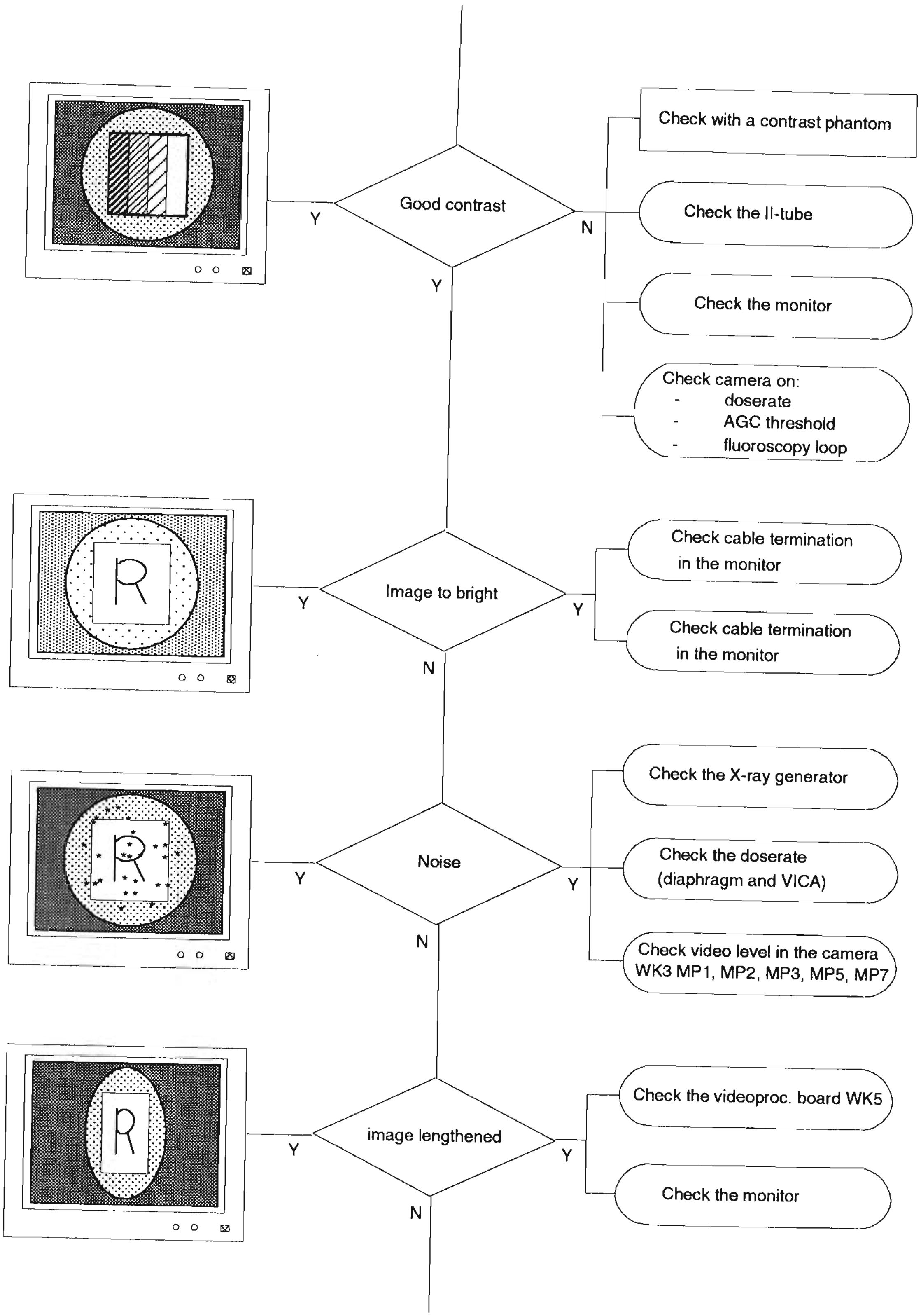
2.7. SERVICE ASPECTS

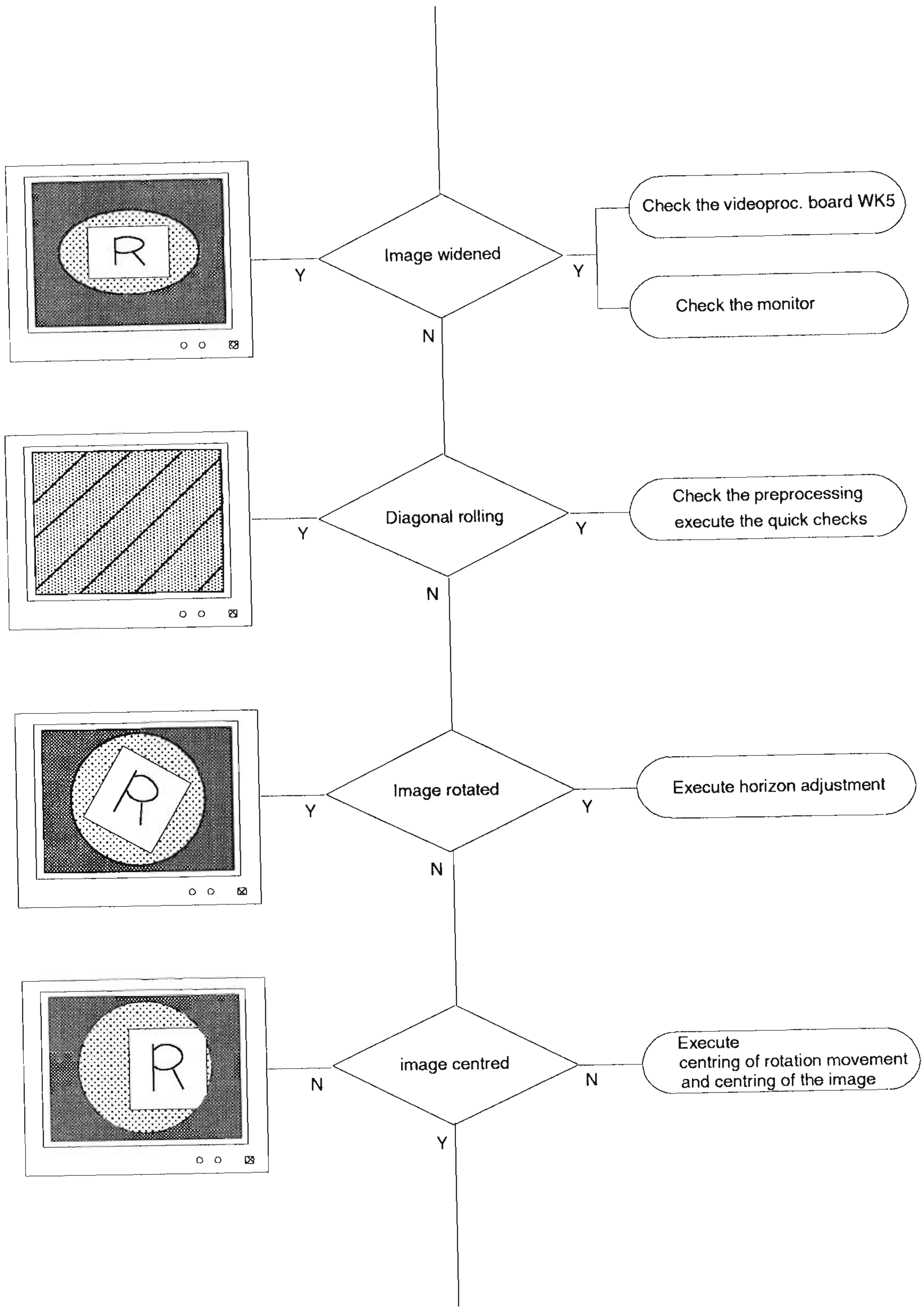
The camera is equiped with two test generators. First the block generator WK3 (see Z1-2), with this generator the VICA signal can be simulated, however the amplitudes are not the same, for instance the VICA value 300mV (BV29) is with the block generator 375mV and VICA 200mV (BV26) is with the block generator 250mV. This is caused by the noise on the VICA signal (the amplitude of the noise is doserate depended). When the block generator is adjusted to the right value, the video signals on every measuring point can be checked see Quick checks and Z1-3. With the ramp generator the white compression curves; the contour correction and the max. video output can be checked.
The video processing board can be checked with the video bypass see quick checks.
The measuring field (large/small) can be made visible on the monitor.
Clean circle and fixed gain are service selectable.
The camera can be checked on errors via the fault finding tree and via the quick checks.

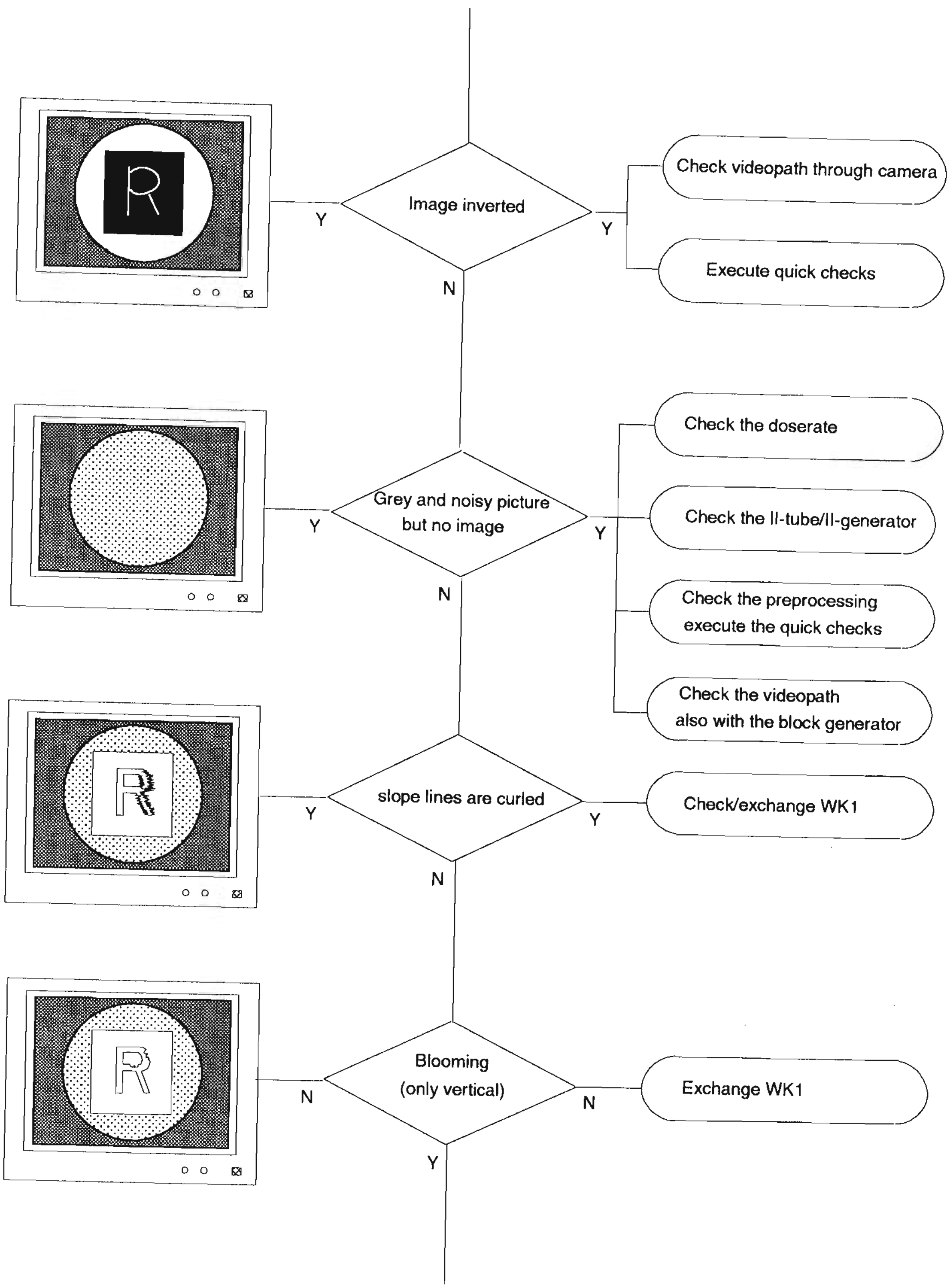
3. TROUBLE SHOOT FLOW CHART

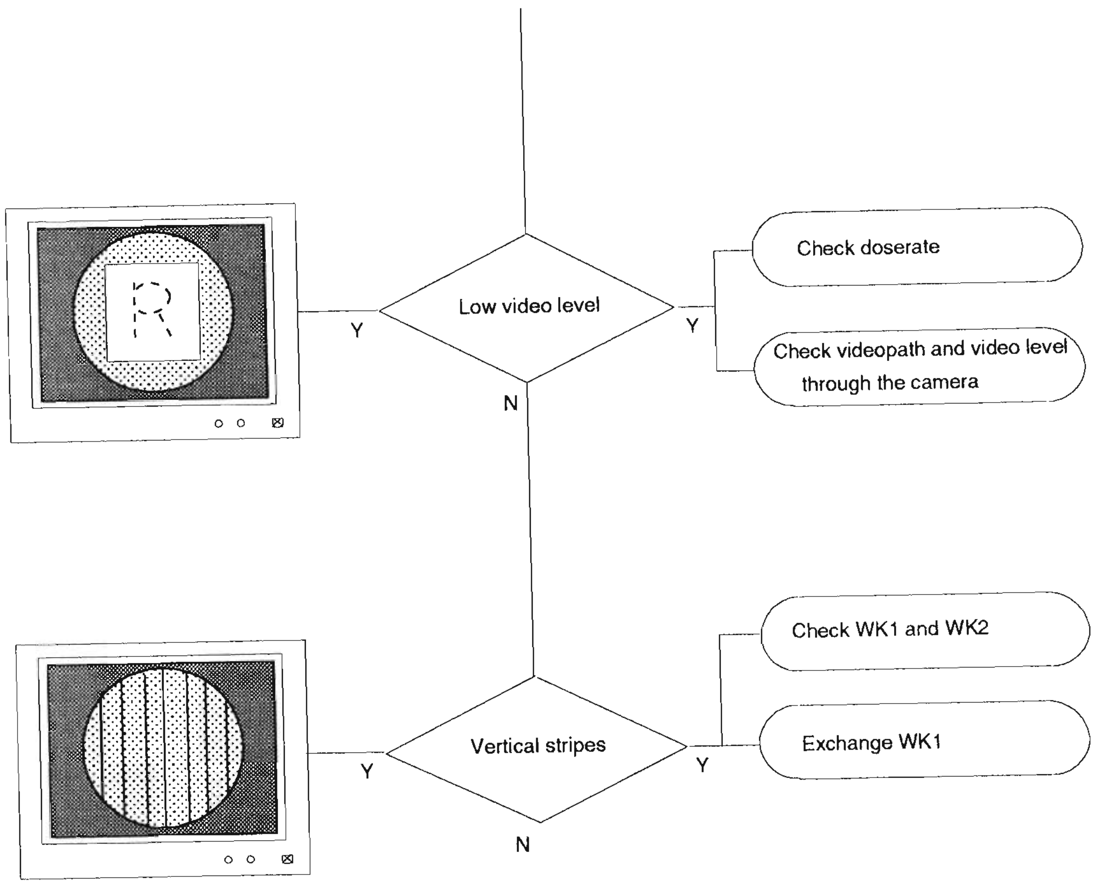
This flow chart is a posible guide to trace a fault on pcb level
Follow the chart and execute the checks and or adjustments.




Good contrast
Y
N
Y
Check with a contrast phantom
Check the II-tube
Check the monitor
Check camera on:
- doserate
- AGC threshold
- fluoroscopy loop
Image to bright
Y
Y
N
Check cable termination in the monitor
Check cable termination in the monitor
Noise
Y
Y
N
Check the X-ray generator
Check the doserate (diaphragm and VICA)
Check video level in the camera WK3 MP1, MP2, MP3, MP5, MP7
image lengthened
Y
Y
N
Check the videoproc. board WK5
Check the monitor


Image widened
Y
Y
N
Check the videoproc. board WK5
Check the monitor
Diagonal rolling
Y
Y
N
Check the preprocessing
execute the quick checks
Image rotated
Y
Y
N
Execute horizon adjustment
image centred
N
N
Y
Execute
centring of rotation movement
and centring of the image


Image inverted
Y
N
Check videopath through camera
Execute quick checks
Grey and noisy picture but no image
Y
N
Check the doserate
Check the II-tube/II-generator
Check the preprocessing execute the quick checks
Check the videopath also with the block generator
slope lines are curled
Y
N
Check/exchange WK1
Blooming (only vertical)
N
Y
Exchange WK1


Low video level
Y
Y
N
Check doserate
Check videopath and video level through the camera
Vertical stripes
Y
Y
N
Check WK1 and WK2
Exchange WK1

4. Quick checks

4.1. Standard settings

See the hardware programmings in section 5 of this manual.

4.2. Supplies

Measure the DC voltages with a multimeter on WK3, (P = positive voltage, N = negative voltage).
Connect the 0 V of the multimeter on WK3 MP2 and measure the following voltages with a measuring pin:

- set WK3 W1:2-3 (clean circle off)

- + 6.4 V (+ 0.2 / - 0.6 V)
- + 15 V (± 0.1 V)
- - 15 V (± 0.1 V)

- + 5 Vsw
- + 10 Vsw
- - 10 Vsw

- set WK3 W1:1-2 (CLCL on)

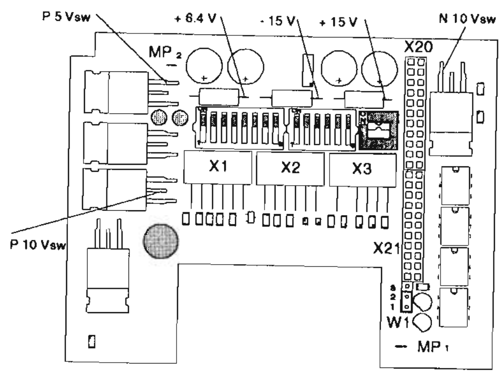


Fig. 2 : Supplies measured on WK3

Measure also on the preprocessing 1 board WK1.
Be carefull you have to measure on the SMD.

- Vsub (8V)
- P15V
- P10V
- N10V
- P5V

If one of the voltages are not correct or even not there then trace where the error appears and exchange the PCB.

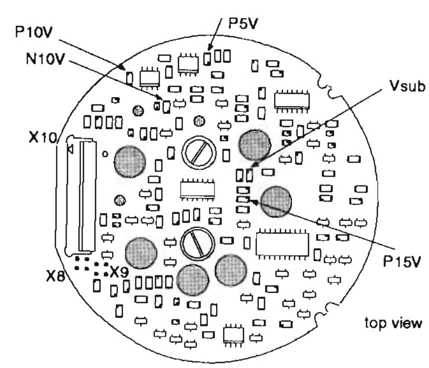


Fig. 3 : Supplies measured on WK1

4.3. Dose control signal

- set WK3:W1 2-3 (clean circle off)
- measure with scope at WK3:MP7 (0 V = WK4:MP1 or MP2)
- adjust with WK3:P1 the block generator level for BV29 to 375 mV and for BV26 to 250 mV
- measure with a multimeter the voltage on WK3:MP13, it must be 1.5 V ± 200 mV
- remove jumper WK3:W1 (no video), the voltage must be 0 V ± 200 mV
- set jumper WK3:W1 in 2-3 (VICA)

4.4. CLEAN CIRCLE

- measure with a scope the VIBS signal, WK3:MP7, terminate with 75 Ω
- the clean circle must be 70 mV ± 5 mV
- the blanking level must be 0 V ± 50 mV
- the sync. level must be -300 mV ± 30 mV

If these values are wrong then check the cable compensation programming X19, on WK3 see Z3-1 for the location.

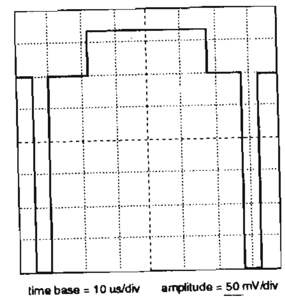


Fig.4 : Clean circle on VIBS

4.5. VIDEO ROUTING WITH THE BLOCK GENERATOR

Set the block generator on (WK3 W1 in 1-2) and measure the video signal on WK3 MP1 and MP14 (0V). Adjust the block generator for BV29 to 375mV and for BV26 to 250mV. See diagram Z1-2 and measure the video signal on the given measuring points and compare it with the drawn signals (no. 1 untill 9) on the diagram.
Set WK3 W1 back to 2-3 when finished with the measurements.

4.6. VIDEO ROUTING WITH THE RAMP GENERATOR

Set WK3:W2 in 1-2 (ramp gen. on). See diagram Z1-2 and measure the video signal on the given measuring points and compare it with the drawn signals (no. 10 untill 17) on the diagram. The amplitude is depended on the programmed white compression curve, WK4 S2:4 on = curve 1 (lower amplitude) S2:4 off = curve 2 (higher amplitude). Check first the adjusted video gain (WK5 P1): set WK4 S2:4 measure the video signal on WK3 MP7 VIBS and check if the max. video is 1100 mV if not execute all the electrical adjustments (section 6). Fig 5 and 6 gives the two curves measured on VIBS WK3 MP7 with the ramp generator on.

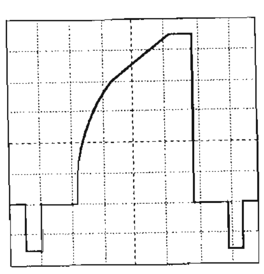


Fig. 5 : white compression curve 2

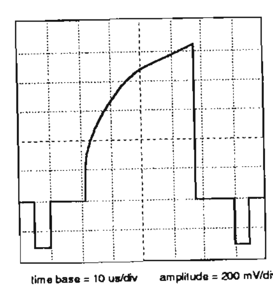


Fig. 6 : white compression curve 1

The contour correction is visible on the video signal on MP6 of WK3
Set WK4:S2-2 on (cont. correction on)
Measure with scope on WK3:MP6 (VICORR), see Figure 3,
A must be between 0.5X and X.

Set WK3 W2 back in 2-3 after the measurements.

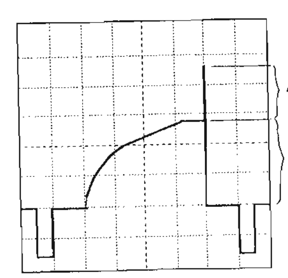


Fig. 7 : contour correction on

Section 4: Replacements

Contents

1. INTRODUCTION

The exchange procedures are easy to follow with the exploded view of the camera, so pull out drawing Z6-1 of section Z.
For all the procedures, except paragraph 1.4., the camera has to be removed from the basiclens.
After an exchange procedure check the next sections on programmings and/or adjustments to execute.

NOTE

In case of replacement of the certifiable items (complete camera), always replace the duplicate label on the inside of the camera cap and on the central labelling station "i" of the stand.

1.1. EXCHANGING THE FLEX

(1) disconnect the flex from WK1 (pull the connector towards you and turn it open)
(2) disconnect the flex from WK2 (pull the connector open)
(3) unscrew [1], and remove the slider
(4) move (with care) the top-plate with the flex out of the sliders
(5) remove the flex connections [2]
(6) exchange the flex with a new one

(7) connect the flex [2] to the top-plate and basic-plate
(8) position the top-plate with flex so that the flex can move between the plates (see the drawing Z6-1)
(9) connect the flex to the WK2 PCB (move the flex into the connector and lock it)
(10) connect the flex to the WK1 PCB (move the flex into the connector and lock it)
(11) mount the slider [1] back to its place

1.2. EXCHANGING THE PCBs

1.2.1. Exchange the sensor assembly

(1) disconnect the flex from WK1 (pull the connector towards you and turn it open)
(2) disconnect WK1:X8 and WK1:X9
(3) loosen the 3 socket-screws [3] (2.5 mm socket-screw driver)
(4) remove the assembly and exchange it with the new one (careful with the flex)
(5) fix the new assy 3 x [3] and connect the flex to WK1 (move the flex into the connector and lock it)
(6) connect WK1:X8 and WK1:X9

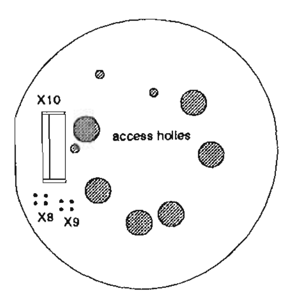


Fig. 1: see the location of X8 and X9

1.2.2. Exchange WK2, WK4 or WK6

(1) follow the instructions (1) until (5) of paragraph 1.1
(2) unscrew 3 x [4] and remove the basic-plate
(3) unscrew 2 x [5] of the defective PCB
(4) incase of a defective WK2 remove WK6 first and unscrew 2 x [6]
(5) exchange the PCB and fix it with the screws [5] (WK 2 with [6])
(6) mount the basic-plate back to its place [4]
(7) follow the instructions (7) and on, of paragraph 1.1

1.2.3. Exchange the shielded WK5

(1) follow the instructions (1) until (5) of paragraph 1.1
(2) remove the two screws [11] from the basic plate flex
(3) remove the two plastic screws [12]
(4) exchange the shielded WK5 and fix it with 2 x [12] and 2 x [11]
(5) follow the instructions (7) and on, of paragraph 1.1

1.2.4. Exchange WK3

(1) follow the instructions (1) until (5) of paragraph 1.1
(2) unscrew 3 x [4] and remove the basic-plate
(3) remove 2 x [5] and remove WK4
(4) unscrew 2 x [6] of WK3
(5) exchange WK3 and fix it 2 x [6]
(6) mount and fix WK4, mount the basic-plate back to its place [4]
(8) follow the instructions (7) and on, of paragraph 1.1

1.3. EXCHANGING THE IRIS MOTOR AND POTENTIOMETER

1.3.1. Exchange the motor

(1) follow the instructions (1) till (3) of paragraph 1.2.1 and remove the assembly
(2) unscrew 2 x [7] and remove the motor
(3) fix the new motor with 2 x [7]
(4) mount the sensor assy back to its place, (5) and (6) of 1.2.1

1.3.2. Exchange the potentiometer

(1) follow the instructions (1) till (3) of paragraph 1.2.1 and remove the assembly
(2) unscrew 2 x [8] and remove the potentiometer
(3) remove also the irismotor 2 x [7]
(4) measure with a multimeter the resistance of pin 1 and 3 of the new pot.meter, measure also between pin 1 and 2; 2 and 3.
Adjust the pot.meter to the value $(0.04 \times R13) + \frac{((R12 + R23) - R13)}{2}$ (turn the axis)
(5) close the diaphragm as far as possible, the diaphragm is accessible through the hole where the motor has to be mounted
(6) mount the new pot.meter to its place 2 x [8]
(7) execute the adjustment in (4) ones more, loosen the screws [8] a bit so you can adjust the pot.meter by turning the house
(8) fasten the pot.meter 2 x [8] and mount the motor 2 x [7]
(9) mount the sensor assy back to its place, (5) and (6) of 1.2.1

1.4. EXCHANGING THE ROTATION DRIVING ASSY

(1) disconnect WK6:X12
(2) remove the assy 2 x [9]
(3) move the stand in a straight position (camera 0 position)
(4) put a cross-wire phantom in front of the II and move manually during fluoroscopy the camera in the 0 position. The horizontal line of the cross-wire must be perpendicular with the horizontal video-lines
(5) connect the new rotation assy on WK6:X12, the motor moves to the 0 position
(6) mount the assy 2 x [9] on the its place
(7) correct the 0 position with the potentiometer (loosen the screws a bit 2 x [10] and adjustment can be done by turning the pot.meter house), check the 0 position during fluoroscopy
(8) fasten the potentiometer 2 x [10]

Section 5: Programmings

Contents

1. INTRODUCTION

Normally the camera is delivered in a factory assembled and adjusted -II/TV subsystem- and no mechanical or electrical adjustments are required in the field.
Only incase of a replacement the programmings have to be executed.

2. Hardware programmings

NOTE

MF = Measuring Field, RF/RC = Radiography-Fluoroscopy stands / Remote-Controle stands.
See drawing Z3-1 for the location of the jumpers/switches.
* *There are no jumpers/switches on the PCBs: WK1 (Preproc.1), WK2 (Preproc.2) and WK6 (Rotairis).*
*1 *on/off don't care in this application.*
*2 *Max. VIBS level programming depends on the type of monitor, see the monitor manual.*
*3 *For surgery stands no cable compensation necessary, park the jumper (A1-2 or A2-3).*
*4 *select the largest circle size, the circle blanking of the MMP will be used.*

PCB	Jumper/ Switch	Position	Operation	Delivered	
				BV29	BV26
WK3 AGC/ADC 1	W1 W2 W3	1-2 (2-3) 1-2 (2-3) 1-2 (2-3)	blockgenerator on (off) rampgenerator on (off) videoproc. bypass (normal use)	2-3 2-3 2-3	2-3 2-3 2-3
	X19	A-B 1 A-B 2 A-B 3 other	3.3 till 10 m 10 till 16.7 m 16.7 till 25 m } cable *3 0 till 3.3 m compensation	other A2-3	other A2-3
WK4 AGC/ADC 2	W1	1-2 (2-3)	clean circle on (off)	1-2	1-2
	S1	on (off)	surgery (RF/RC)	on	on
	S2:1 S2:2 S2:3 S2:4 S2:5 S2:6	on (off) on (off) on (off) on (off) on (off) on (off)	X-tal lock (mains lock) contour correction; on (off) frame accumulation (field) white compression; curve 1 (curve 2) fixed gain; on (off = normal use) max. VIBS level; 1100 mV (700 mV)	on on on on off *2 on	on on on on off *2 on
	S3:1 S3:2 S3:3 S3:4 S3:5 S3:6 S3:7 S3:8	on (off) on (off) on (off) on (off) on (off) on (off) on (off) on (off)	horizontal image; normal (inverted) ISU 9807 519 10001 (off = not used) MF; relative (absolute) value MF rel C0 } see the table MF rel C1 } on the next page MF; remote (local) selectable MF; large (small) selected (if S3:6=off) AGC soft rise; on (off)	on *1 on off *1 on *1 on on *1 on off	on *1 on on on on on *1 on off
WK5 Videoproc.	S1 S1 S1 S1 S1	0 . etc 7 8 till F	smallest circle blanking } the circle blanking will increase 8 lines with every step largest circle blanking are the same values as for 0 till 7	*4 7	*4 7
	S2	left (right)	normal use (MF visible on the image)	left	left

NOTE

The MF or the service cross is only visible on the monitor if WK5:S2 is positioned to the right and WK4:W1 in 1-2 (CLCL off).

S3:3 (MF relative/absolute)	S3:4 (MF rel C0)	S3:5 (MF rel C1)	Operation
on	off	off	service cross
on	off	on	not used
on	on	off	MF for RF/RC
on	on	on	MF for BV26
off	off	off	service cross
off	off	on	MF 7" format BV29
off	on	off	MF 9" format BV29
off	on	on	MF 5" format BV29

The large or small MF are selectable with S3:7 (if S3:6 is off). The MF values are given in % of the nominal clean circle size, see the next table. The MF values for BV29 are absolute, in this table they are converted into % of the nominal CLCL size.

		BV26	BV29
large MF	9" format	-	32
	7" format	-	44
	5" format	50	50
small MF	9" format	-	18
	7" format	-	25
	5" format	30	30
		[%]	[%]

Section 6: Adjustments

Contents

1. Adjustment facilities

Mechanical adjustments

Adjustment	Service adjustment
optical camera focusing	yes
centring of the rotation movement	yes
centring of the image	yes
horizon	yes

Electrical adjustments

PCB	Potentiometer	Operation	Service adjustment
WK1 Preproc. 1	R24	+ 15 V	NO
	R28	V sub.	NO
	R57	cross talk compensation	NO
	R58	gain	NO
WK2 Preproc. 2	non		-
WK3 AGC/ADC 1	P1	amplitude blockgenerator	yes
	P2	doserate adjustment medium format	yes
	P3	doserate adjustment small format	yes
	P4	black level	yes
	P5	fixed gain adjustment	yes
	P6	AGC threshold small MF	yes
	P7	AGC threshold large MF	yes
	P8	offset	NO
WK4 AGC/ADC 2	non	-	-
WK5 Videoproc.	P1	gain	yes
WK6 Rotairis	P1	irisdiaphragm (only for large format)	yes
	P2	not used (removed from the PCB)	NO
	P3	not used (removed from the PCB)	NO
	P4	offset	NO

2. What to do table

After a replacement, of a PCB or a mechanical part, it might be necessary to execute a mechanical or electrical adjustment. The information in the following table is a guide through the necessary adjustments.

After replacement of	adjust	paragraph	comment
Flex cable	no adjustments	-	
Sensor assy	optical camera focusing centring of the image circle blanking size	3.1 3.3 4.8	
Integrated optics	optical camera focusing centring of the image horizon circle blanking size	3.1 3.3 3.4 4.8	
Iris potentiometer	doserate	4.9	see (sub)system manual
Iris motor assy	no adjustments	-	
Rotation driving assy	horizon	3.3	
Rotation bearing assy	centring of the rotation movement centring of the image horizon	3.2 3.3 3.4	
WK2 preproc. 2	no adjustments	-	
WK3 AGC/ADC 1 WK4 AGC/ADC 2 WK5 videoproc.	presettings video gain AGC threshold small MF AGC threshold large MF fixed gain doserate preset middle/small format black level doserate	4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8	see (sub)system manual
WK6 rotairis	doserate	4.9	see (sub)system manual

3. Mechanical adjustments

Warning

For all the mechanical adjustments you need to use fluoroscopy, protect yourself and execute the adjustments without being exposed to X-Rays if necessary use lead protection.

See drawing Z6-1 for the location of the adjustment nuts and screws.

3.1. Optical camera focusing

- interconnect WK6:MP1 and WK6:MP4 (watchdog irisdiaphragm = off) and adjust the irisdiaphragm fully open with WK6:P1 (clock wise)? Remove the interconnection.
- put a line phantom (FUNK 38) in front of the II-tube (perpendicular to the TV scanning)
- see Z6-1, unlock the focusing screw
- the focusing screw is accessible through the preproc.1 board (see the figure), focus the image during fluoroscopy, lock the focusing screw.

3.2. Centring of the rotation movement

- remove all objects between the collimator and the II-tube
- select the largest blanking circle on the videoproc. board WK5:S1
- select large format
- put a phantom, with a marked centre, in front of the II-tube and reset the camera rotation (0°)
- rotate the camera to -90°, switch the fluoroscopy on and off (the image will be stored and displayed), mark the centre of the phantom on the monitor (1)
- rotate the camera to +90° (this means 180° cw with the rotation-marker on the monitor), mark the centre again (2)
- rotate the camera to 0° (push both rotation switches on the desk)
- draw a line between the two points on the monitor and mark the middle of the two points (3)
- the image will move diagonally on the monitor when turning one of the two nuts see Fig 2
- adjust the camera (4) to the marked middle (3) with an hexagonal wrench (use fluoroscopy)

Between WK1 and the flex, at the top of the camera, is enough space to reach the screws with a hexagonal wrench (no. 3) see Fig.2.

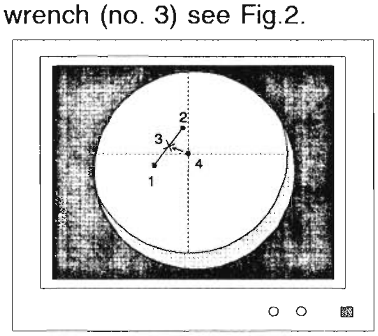


Fig 1 : Centring of the rotation

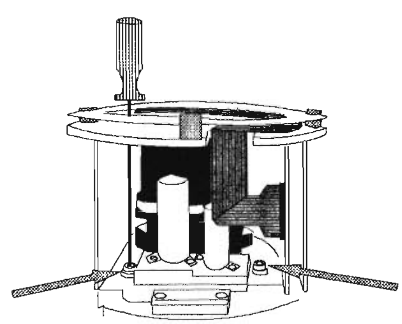


Fig 2 : The nuts can be reached via the top of the camera

3.3. Centring of the image

- remove all objects between the collimator and the II-tube and put a cross section phantom in front of the II-tube
- select large format
- set; WK5 S2 to the right, WK4 S3:3 on, WK4 S3:4 off, WK4 S3:5 off (service cross chosen)
- select KV manual, switch the fluoroscopy on and off and examine the image-hold on the monitor
- see Fig. 4 for centring of the image use the two nuts (both nuts are reachable via WK3, rotate the camera + and - 90°)
- adjust (with an open-ended spanner) the image exactly in the middle of the blanking circle, check the position during fluoroscopy

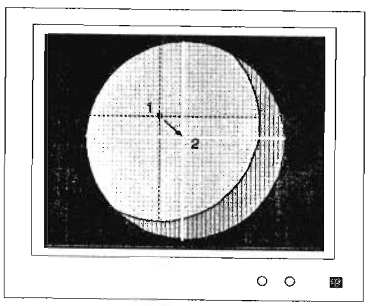


Fig 3 : Centring of the image

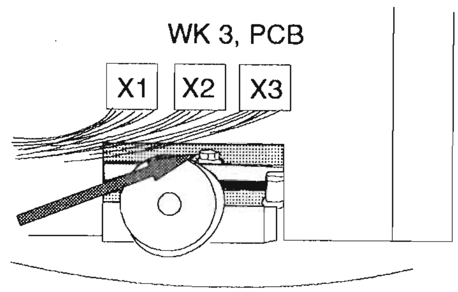


Fig 4: Use open ended spanner no.7

3.4. Horizon adjustment

- put the C-arm of the stand in the 0° position
- remove all objects between the collimator and the II-tube and put a cross section phantom in front of the II-tube
- select large format
- set; WK5 S2 to the right, WK4 S3:3 on, WK4 S3:4 off, WK4 S3:5 off (service cross chosen)
- select KV manual, switch the fluoroscopy on and off and examine the image-hold on the monitor
- loosen the rotation potentiometer a bit and turn the pot.meter housing until the horizontal line of the phantom is in the 0° position (= the cross section phantom lies exactly on the service cross)
- check the 0° position, during fluoroscopy, using image reverse horizontal (WK4:S3-1)

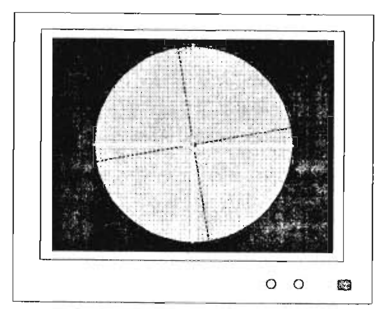


Fig 5 : Horizon adjustment

- rotate the camera + and - 180° during fluoroscopy and check if the centre of the phantom is the same as the centre of the image. If not execute adjustment 3.2. and 3.3. again.
- set WK5 S2 to the left position and WK4 S3:3/4/5 back to the original positions see also section 5.

4. ELECTRICAL ADJUSTMENTS

NOTE

All the video values are based on a max. VIBS of 1100 mV. So all the adjustments have to be executed with a max. VIBS of 1100 mV. When 700 mV is used (monitor depended) program this after execution of the adjustments.

All the adjustments in this chapter have to be executed in the correct sequence.

4.1. PRESETTINGS

See drawing Z3-1 for the location of the jumpers, switches and potentiometers.

Carry out the following settings:
- jumper WK4 W1:2-3 (clean circle off)
- switch WK4 S2-6:on (max. VIBS = 1100 mV)

- jumper WK3 W1:1-2 (block gen. on) and turn WK3:**P1** clock wise (amplitude = 0V)
- measure with a oscilloscope on WK3:MP7 VIBS (0V = WK4:MP1 or MP2), trigger external on the midline WK5:MP1
- adjust the black level with WK3:**P4** to 45mV

4.2. VIDEO GAIN

- set : WK3 W2:1-2 (rampgenerator on)
  WK4 S2-4:off (white compression curve 2)
- measure VIBS WK3:MP7 and adjust the top of the video to 1100 mV with WK5:**P1** see fig. 3
- set : WK3 W2:2-3 (rampgenerator off)
  WK4 S2-4:on (white compression curve 1)

- adjust the black level once more with WK3:**P4** to 45mV

- measure on WK3:MP1 / MP14 VIN and adjust the block gen. with WK3:**P1** to 375 mV for BV29 and 250 mV for BV26.

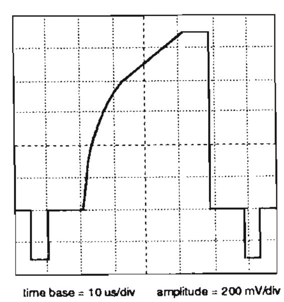


Fig. 3 : max. video level

4.3. AGC THRESHOLD SMALL MF

- set : WK4 S3-6:off (MF local selectable)
  WK4 S3-7:off (small MF selected)
- measure VIBS WK3:MP7 and adjust the threshold to 400 mV with WK3:**P6**, see Fig 4.

4.4. AGC THRESHOLD LARGE MF

- set : WK4 S3-7:on (large MF selected)
- measure VIBS WK3:MP7 and adjust the threshold to 400 mV with WK3:**P7**, see Fig 4.

4.5. FIXED GAIN ADJUSTMENT

- select large format
- set WK4 S2-5:on (fixed gain on)
- measure VIBS WK3:MP7 and adjust the level to 400 mV with WK3:**P5**, see Fig 4.

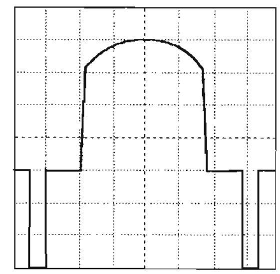


Fig. 4 : VIBS threshold

4.6. DOSERATE PRESET FOR MIDDLE AND SMALL FORMAT

- in case of a 15cm (6") II-tube continue with 4.7.

- select the middle format
- measure the video on VIN WK3:MP1 and adjust with WK3:**P1** the block generator to 375 mV
- measure with a voltmeter the DRFLDFPA signal WK3:MP13 (0V = WK4:MP1 or MP2) and adjust it to 2.04 V with WK3:**P2**
- select the small format
- measure with a voltmeter the DRFLDFPA signal WK3:MP13 and adjust it to 2.33 V with WK3:**P3**

4.7. BLACK LEVEL ADJUSTMENT

- set WK3 W1:2-3 (block gen. off)
- measure the signal on VIBS WK3:MP7 and adjust the black level to 45 mV with WK3:**P4**

Put the jumper/switch setting back to its original position (check section 5, Programmings)
- jumper WK4 W1:1-2 (cleancircle on)
- switch WK4 S2-6 (max. VIBS, monitor depended see section 5 Programmings)
- switch WK4 S3-6:on (MF remote selectable)
- switch WK4 S2-5:off (fixed gain off)

4.8. DOSERATE ADJUSTMENT

- remove the grid from the II-shield
- select large format
- put an 1.5 mm Cu plate in front of the X-ray tube
- put the X-ray probe infront of the II-tube
- see the system manual for the settings and the doserate values
- interconnect WK6:MP1 and WK6:MP4 (watchdog irisdiaphragm = off)
- if the desired doserate is set, measure the DRFLDFPA signal WK3:MP13 during fluoroscopy
- adjust the irisdiaphragm with WK6:**P1** until DRFLDFPA = 1.5V, use fluoroscopy only during the measurement.
- remove the interconnection WK6:MP1-MP4.

Incase of an one format system the doserate adjustment is finished, for the triple format systems continue with the adjustments.

- select the middle format and set the desired doserate (see the system manual)
- check if the DRFLDFPA signal on WK3:MP13 stabilizes on 1.5 V ± 10% (during fluoroscopy) if not readjust WK3:**P2** until DRFLDFPA stabilizes on 1.5 V
- select the small format and set the desired doserate (see the system manual)
- check if the DRFLDFPA signal on WK3:MP13 stabilizes on 1.5 V ± 10% (during fluoroscopy) if not readjust WK3:**P3** until DRFLDFPA stabilizes on 1.5 V

Philips Medical Systems

PARTS LIST

Service

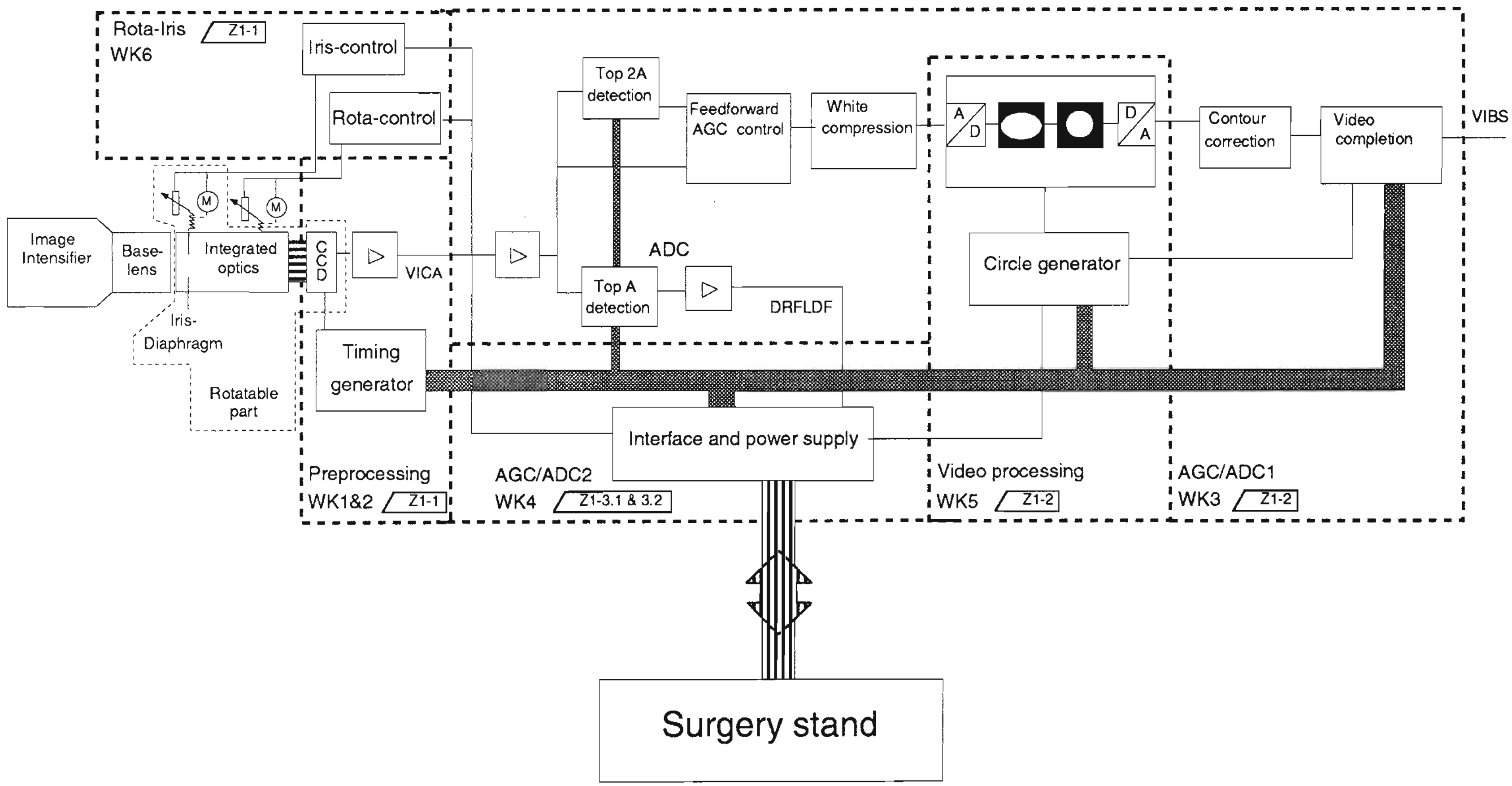
Description	:	XTV8SRI/50 HZ/60 HZ ROT. CCD TV-CHAIN	**Ref. No.**	:	9896 010 02281 9896 010 02291
Publication No.	:	4522 983 33961	**Product Group**	:	744

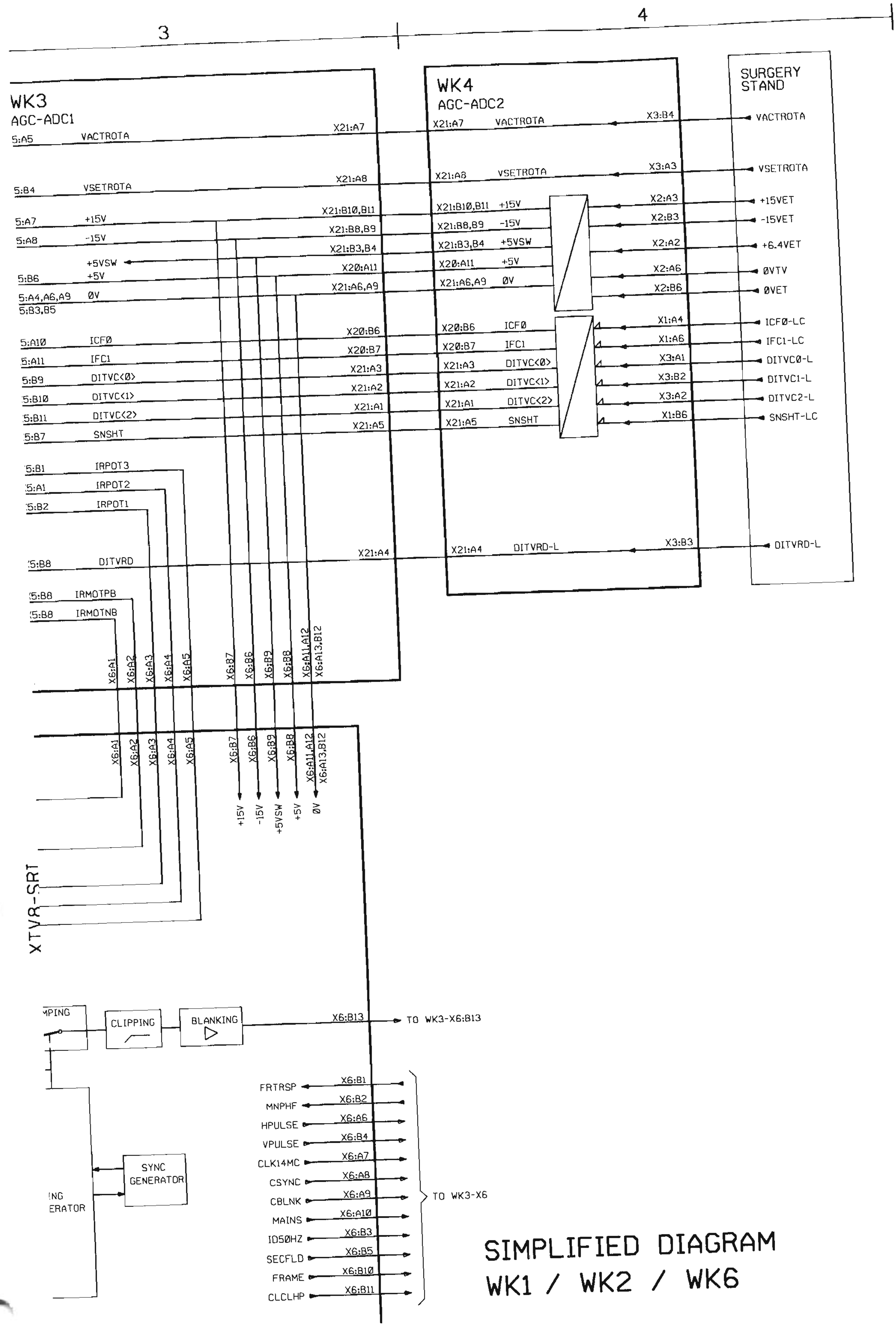
LIST OF PAGES AND DRAWINGS

SCHEME/ PAGE 1	INDEX 2	CODENUMBER 3	DESCRIPTION 4	DATA 5
PZ-1	WK2	4522 167 00086	preprocessing board 2	
PZ-1	WK3	4522 167 00108	AGC/ADC 1 board	
PZ-1	WK4	4522 167 00112	AGC/ADC 2 board	
PZ-1	WK5	4522 167 00681	Video proc. 1 board	
PZ-1	WK6	4522 167 00091	Rota Iris XTV-8S board	
PZ-1	a	4522 161 68823	distance block	
PZ-1	b	4522 161 85241	top plate EMC	
PZ-1	c	4522 161 68744	plate for flex	
PZ-1	d	4522 161 69302	fixing ring for flex	2x
PZ-1	e	4522 167 00131	Rotaflex	
PZ-1	f	4522 121 80363	clamping block	4x
PZ-1	g	4522 161 75421	iris potmeter assy	
PZ-1	h	4522 161 51781	pressure spring	4x
PZ-1	j	4522 161 69442	XTV-8S integrated optics	
PZ-1	k	4522 161 75402	iris motor assy.	
PZ-1	l	4522 161 75361	sensor assy 50 Hz	50Hz
PZ-1	l	4522 161 75381	sensor assy 60Hz	60Hz
PZ-1	m	4522 161 75441	rotation bearing	
PZ-1	n	4522 161 75461	rotation driving assy	
PZ-1	o	4522 161 69182	screw	2x

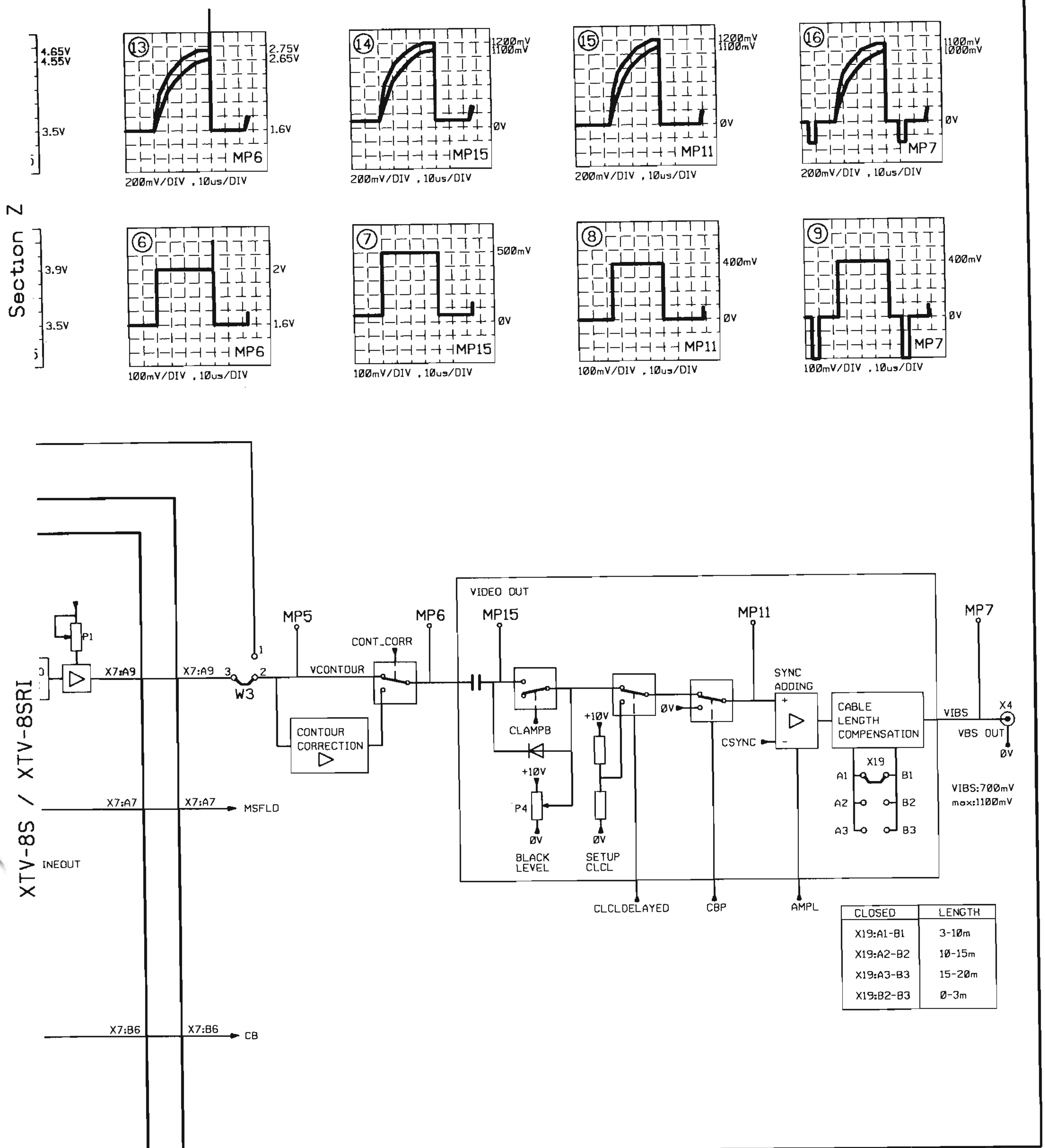
Section Z: Drawings

Contents


Rota-Iris
WK6
Z1-1
Iris-control
Rota-control
M
M
Image Intensifier
Base-lens
Integrated optics
CCD
Iris-Diaphragm
Rotatable part
Timing generator
VICA
Preprocessing
WK1&2
Z1-1
Top 2A detection
Feedforward AGC control
White compression
ADC
Top A detection
DRFLDF
Interface and power supply
AGC/ADC2
WK4
Z1-3.1 & 3.2
A/D
D/A
Circle generator
Video processing
WK5
Z1-2
Contour correction
Video completion
VIBS
AGC/ADC1
WK3
Z1-2
Surgery stand



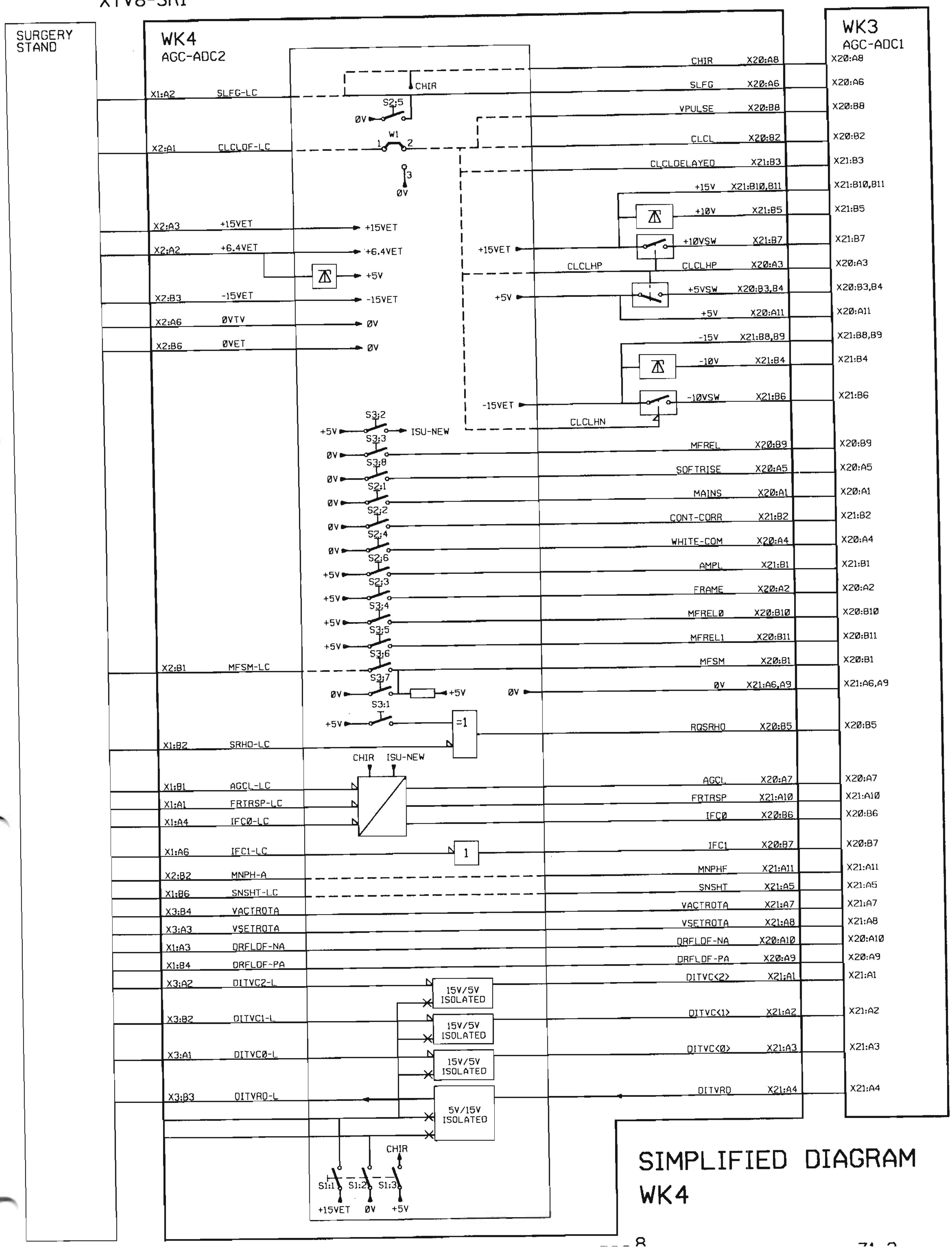
SIMPLIFIED DIAGRAM
WK1 / WK2 / WK6



CLOSED	LENGTH
X19:A1-B1	3-10m
X19:A2-B2	10-15m
X19:A3-B3	15-20m
X19:B2-B3	0-3m

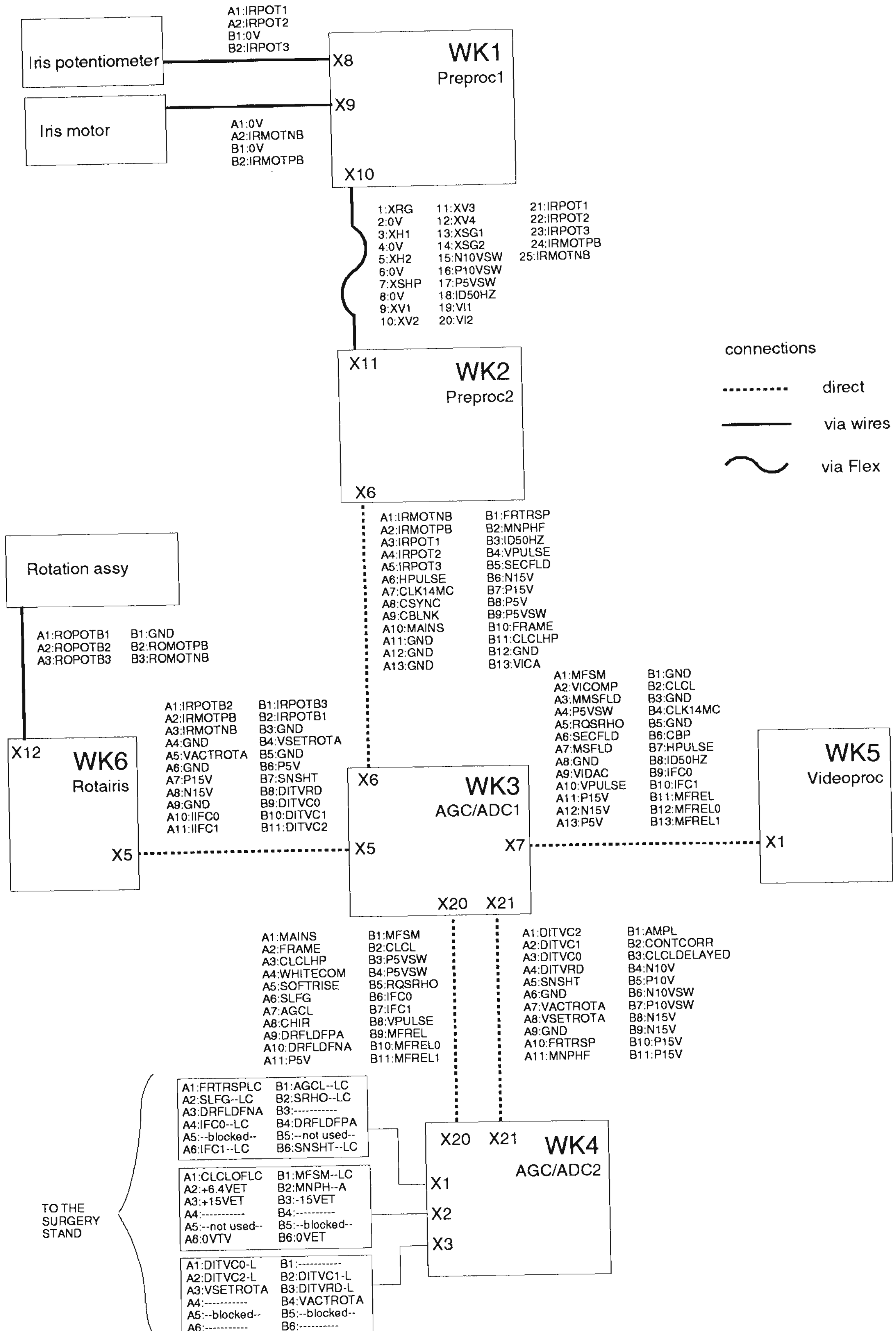
SIMPLIFIED DIAGRAM WK3

XTV8-SRI



SIMPLIFIED DIAGRAM WK4

4522 983 3751 (NOT TO BE USED FOR ORDERING SERVICE MANUALS)


A1:IRPOT1
A2:IRPOT2
B1:0V
B2:IRPOT3
Iris potentiometer
X8
WK1
Preproc1
X9
Iris motor
A1:0V
A2:IRMOTNB
B1:0V
B2:IRMOTPB
X10
1:XRG
2:0V
3:XH1
4:0V
5:XH2
6:0V
7:XSHP
8:0V
9:XV1
10:XV2
11:XV3
12:XV4
13:XSG1
14:XSG2
15:N10VSW
16:P10VSW
17:P5VSW
18:ID50HZ
19:VI1
20:VI2
21:IRPOT1
22:IRPOT2
23:IRPOT3
24:IRMOTPB
25:IRMOTNB
X11
WK2
Preproc2
connections
direct
via wires
via Flex
X6
A1:IRMOTNB
A2:IRMOTPB
A3:IRPOT1
A4:IRPOT2
A5:IRPOT3
A6:HPULSE
A7:CLK14MC
A8:CSYNC
A9:CBLNK
A10:MAINS
A11:GND
A12:GND
A13:GND
B1:FRTRSP
B2:MNPHF
B3:ID50HZ
B4:VPULSE
B5:SECFLD
B6:N15V
B7:P15V
B8:P5V
B9:P5VSW
B10:FRAME
B11:CLCLHP
B12:GND
B13:VICA
Rotation assy
A1:ROPOTB1
A2:ROPOTB2
A3:ROPOTB3
B1:GND
B2:ROMOTPB
B3:ROMOTNB
A1:IRPOTB2
A2:IRMOTPB
A3:IRMOTNB
A4:GND
A5:VACTROTA
A6:GND
A7:P15V
A8:N15V
A9:GND
A10:IIFC0
A11:IIFC1
B1:IRPOTB3
B2:IRPOTB1
B3:GND
B4:VSETROTA
B5:GND
B6:P5V
B7:SNSHT
B8:DITVRD
B9:DITVC0
B10:DITVC1
B11:DITVC2
A1:MFSM
A2:VICOMP
A3:MMSFLD
A4:P5VSW
A5:RQSRHO
A6:SECFLD
A7:MSFLD
A8:GND
A9:VIDAC
A10:VPULSE
A11:P15V
A12:N15V
A13:P5V
B1:GND
B2:CLCL
B3:GND
B4:CLK14MC
B5:GND
B6:CBP
B7:HPULSE
B8:ID50HZ
B9:IFC0
B10:IFC1
B11:MFREL
B12:MFREL0
B13:MFREL1
X12
WK6
Rotairis
X5
X6
WK3
AGC/ADC1
X5
X7
WK5
Videoproc
X1
X20
X21
A1:MAINS
A2:FRAME
A3:CLCLHP
A4:WHITECOM
A5:SOFTRISE
A6:SLFG
A7:AGCL
A8:CHIR
A9:DRFLDFPA
A10:DRFLDFNA
A11:P5V
B1:MFSM
B2:CLCL
B3:P5VSW
B4:P5VSW
B5:RQSRHO
B6:IFC0
B7:IFC1
B8:VPULSE
B9:MFREL
B10:MFREL0
B11:MFREL1
A1:DITVC2
A2:DITVC1
A3:DITVC0
A4:DITVRD
A5:SNSHT
A6:GND
A7:VACTROTA
A8:VSETROTA
A9:GND
A10:FRTRSP
A11:MNPHF
B1:AMPL
B2:CONTCORR
B3:CLCLDELAYED
B4:N10V
B5:P10V
B6:N10VSW
B7:P10VSW
B8:N15V
B9:N15V
B10:P15V
B11:P15V
A1:FRTRSPLC
A2:SLFG--LC
A3:DRFLDFNA
A4:IFC0--LC
A5:--blocked--
A6:IFC1--LC
B1:AGCL--LC
B2:SRHO--LC
B3:-----------
B4:DRFLDFPA
B5:--not used--
B6:SNSHT--LC
X20
X21
WK4
AGC/ADC2
X1
X2
X3
A1:CLCLOFLC
A2:+6.4VET
A3:+15VET
A4:-----------
A5:--not used--
A6:0VTV
B1:MFSM--LC
B2:MNPH--A
B3:-15VET
B4:----------
B5:--blocked--
B6:0VET
TO THE
SURGERY
STAND
A1:DITVC0-L
A2:DITVC2-L
A3:VSETROTA
A4:-----------
A5:--blocked--
A6:-----------
B1:-----------
B2:DITVC1-L
B3:DITVRD-L
B4:VACTROTA
B5:--blocked--
B6:----------

Mnemonic	Explanation
AGCL	Automatic Gain Control Lock
AMPL	AMPLitude
CBLNK	Circle BLaNKing
CBP	Circle Blanking
CHIR	CHIRurgie (surgery)
CLCL	CLean CircLe
CLCLDELAYED	CLean CircLe DELAYED
CLCLHP	CLean CircLe
CLK14MC	CLocK 14 Mega Cycles
CONTCORR	CONTour CORRection
CSYNC	C SYNChronisation pulse
DITVC0	DIaphragm TV Code 0
DITVC1	DIaphragm TV Code 1
DITVC2	DIaphragm TV Code 2
DITVRD	DIaphragm TV ReaDy
DRFLDFPA	DoseRate FLuoroscopy Differential Signal Positive Analog
DRFLDFNA	DRFLDFNegative Analog
FRAME	FRAME / field
FRTRSP	FRame Transfer Suppression
GND	GrouND
HPULSE	Horizontal line PULSE
ID50HZ	IDentity 50 HertZ
IFC0	Intensifier Format 0
IFC1	Intensifier Format 1
IRPOT1	IRis POTentiometer pin 1
IRPOT2	IRis POTentiometer pin 2
IRPOT3	IRis POTentiometer pin 3
IRMOTNB	IRis MOTor Negative
IRMOTPB	IRis MOTor Positive
MAINS	MAINS
MFREL	Measuring Field RELative
MFREL0	Measuring Field RELative 0
MFREL1	Measuring Field RELative 1
MFSM	Measuring Field SMall
MMSFLD	Measuring Field
MNPHF	MaiNs PHase
MSFLD	Measuring Field

Mnemonic	Explanation
N10V	Negative 10 V
N10VSW	Negative 10 V SWitched
N15V	Negative 15 V
P5V	Positive 5 V
P5VSW	Positive 5 V SWitched
P10VSW	Positive 10 V SWitched
P15V	Positive 15 V
ROMOTNB	ROtation MOTor Negative
ROMOTPB	ROtation MOTor Positive
ROPOTB1	ROtation POTentionmeter B1
ROPOTB2	ROtation POTentionmeter B2
ROPOTB3	ROtation POTentionmeter B3
RQSRHO	ReQueSt Reverse Horizontal
SECFLD	SECond FieLD
SLFG	SeLect Fixed Gain
SNSHT	SNap SHoT
SOFTRISE	SOFTRISE
VACTROTA	Voltage ACTual ROTAtion
VSETROTA	Voltage SETpoint ROTAtion
VI1	Video 1
VI2	Video 2
VICA	VIdeo CAmera
VICOMP	VIdeo after white COMPression
VIDAC	VIdeo after Digital/Analog Conversion
VPULSE	Vertical line PULSE
WHITECOM	WHITE COMPression
XH1	Horizontal clock 1
XH2	Horizontal clock 2
XRG	Reset Gate
XSG1	Sensor charGe 1
XSG2	Sensor charGe 2
XSHP	Sample Hold Pulse
XV1	Vertical clock 1
XV2	Vertical clock 2
XV3	Vertical clock 3
XV4	Vertical clock 4
+6.4VET	+6.4 Volt ExTernal
+15VET	+15 Volt ExTernal
-15VET	-15 Volt ExTernal
0VET	0 Volt ExTernal
0VTV	0 Volt from TV